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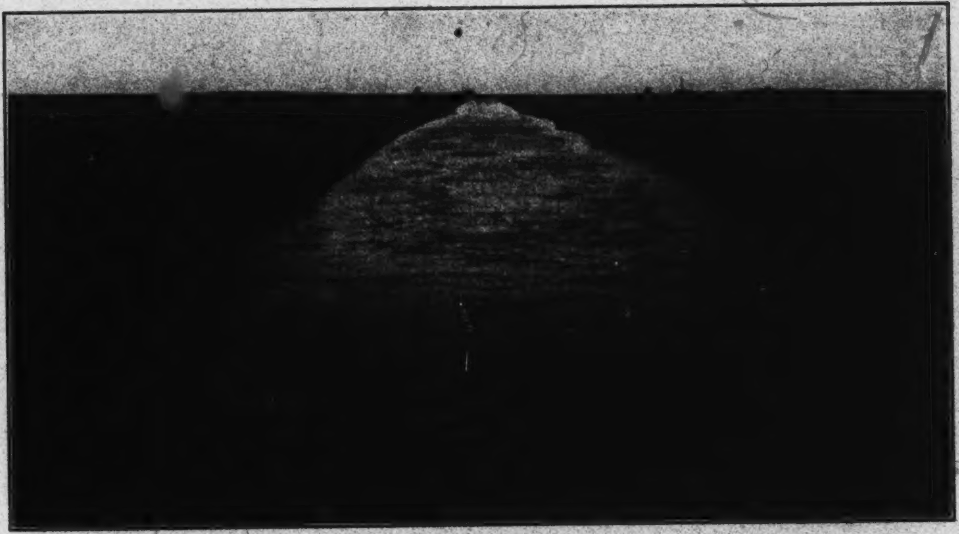

A COMMUNITY CANAL

THE DEVELOPMENT OF INSTITUTIONS UNDER IRRIGATION

WITH SPECIAL REFERENCE TO EARLY UTAH CONDITIONS

BY

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PREFACE

The Mormons entered the Great Salt Lake Valley July 21, 1847. Little was then known of the Great West, its possibilities or problems. The Mormon pioneers, except in so far as they had read the reports of trappers, hunters and explorers, knew no more about the West or its problems than did their fellow countrymen. Unyielding as many of these problems were, they were to be grappled and solved in a typical American fashion by the new settlers who were mentally, physically and intellectually well prepared through experience for the task. The solutions were undertaken by them in the same orderly fashion that had characterized their ancestors in the solving of New World problems from the days of Jamestown and Plymouth.

One of the important problems about which they knew little or nothing was irrigation. From every point of view, it was the paramount problem. Manufactured commodities could be obtained, with considerable effort, from the East, but food must be produced in the territory if it was to become the permanent abode of the new settlers. This could be accomplished only through a system of irrigation. The Utah pioneers, through necessity, turned their attention to this task and were successful, introducing irrigation on a large scale to America. This introduction not only involved the application of water to the land, but the establishment of institutions of irrigation. How the Mormons acquired a knowledge of the principles and practices of applying water to the soil has been well told by others. The story, however, of how they developed institutions of irrigation has never been adequately told so far as the writer knows. Not only is it an intensely interesting story in itself, but the principles and institutions evolved are, in many respects, as applicable to the West to-day as they were when first applied. They embody valuable lessons in the institutional use of water for the development of communal life in arid America. In fact they include some of the best principles for which the ablest American thinkers on irrigation are now striving.

The effort has been made in this brief treatise to allow the original sources to tell their own story for good or ill. The aim of the writer has been to chronicle the successes and failures with equal honesty.

Necessarily much of the information contained in the treatise was obtained through actual field work by the writer. The main written sources used by the writer were Pratt's Diary, Snow's Diary, Laws of Deseret, Session Laws of the Territory of Utah, Land Laws of the United States, Kinney's Irrigation, Wiel's Water Rights in the Western States, Minutes of the County Courts of the Counties of Cache, Box Elder, Weber, Davis, Salt Lake, Utah, Sanpete, etc., Records of the County Water Commissions of the counties, Water Records on file in the offices of County Recorders, Minutes of the City Councils of the cities of Salt Lake, Ogden, Logan, Provo; legislation of the territory, State and the United States pertaining to irrigation, decisions of Supreme and District Courts of the Territory and State of Utah, Reports of State Engineers, Records of the State Land Board, U. S. legislation pertaining to Carey Act and Reclamation Projects; Bulletins on Irrigation by U. S. Government.

The thanks of the writer are gratefully extended to President John A. Widtsoe, University of Utah; Prof. O. W. Israelson, Utah Agricultural College; Professor O. J. P. Widtsoe, and Dr. A. L. Neff of the University of Utah for their many helpful suggestions.

GEORGE THOMAS.

Salt Lake City, Dec., 1919.

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THE DEVELOPMENT OF INSTITUTIONS UNDER IRRIGATION

CHAPTER I

INTRODUCTION

Irrigation has become an established institution in the West and in many respects its achievements have been wonderful. Yet it is possible only under certain conditions. There are hundreds of millions of fertile acres that will never be reclaimed because they will never feel the quickening effect of water in sufficient quantities to become productive. Accessible water is not available in sufficient quantities, even through storage of the winter rains and melted snows, to supply the needs of plants on the extensive arid areas. Far out on the plains or plateaus water could not be conveyed economically to the lands, even if there were an abundance obtainable in the mountains. From the foregoing it is not meant to convey the idea that the supply of water is nearly exhausted. Far from it; millions of acres can and will be redeemed with water now going to waste or excessively used. Yet after the available water supply is exhausted, whole sections of country will remain unreclaimed.

Strange as it may seem to many, the very foundation of irrigation in this country rests upon the great systems of mountains traversing the western part of the continent from the north to the south. These systems comprise the Sierra Nevada, Rocky Mountains, and like ranges and chains. The main bodies of these mountains extend several thousands of feet above the sea level and their monumental peaks tower several thousand feet higher. Their lofty peaks tap the clouds and draw away from them the moisture in the form of snow and water and store it away in the soil as water or in the ravines of the mountains as snow and ice until needed. Some persons maintain that the mountains prevent the movement of moisture in the air and thus condemn large western areas to infertility. Such speculation can never be demonstrated one way or another. But it is a fact that as nature exists, the mountains are the fountain-heads of irrigation. In autumn, winter, and spring, moisture falls on the mountains, in the valleys, and on the plateaus. A small amount falls in the summer or growing season, but not enough to supply moisture for plant growth. Generally when the rainfall is less than 20 inches annually irrigation must be resorted to. Such a statement must be qualified by the nature of the crop and the climatic conditions. Sugar beets, alfalfa and fruit require more water than rye and winter wheat. When the rainfall and the growing season are coincident, less moisture is necessary to produce a crop because the plant can use the moisture as it falls. The loss through the run-off is much less than it is when the ground is frozen a considerable part of the time while it is raining and snowing. Under later conditions when the thaws come in the spring, much of the water runs off and goes to waste. The rainfall in Utah is about twelve to fifteen inches a year and the ground is frozen a considerable part of the time while it is raining and snowing. Due to the frozen conditions of the soil when the thaws come, much of the water runs off and goes to waste. The mountains usually have a much heavier fall than the valleys.

The mountains furnish large drainage areas and through their contour gather the water run-off into the mountain streams which carry it to the valleys below. From these streams it is diverted by means of canals to the farming lands. If, however, there were not impeding forces the water would rush down in torrents as soon as it descended from the clouds. Coursing down the steep hills and canyons as it does, if unretarded in its movement and undiminished in its quantity, it would wash away the best soils and destroy the valleys.

There are three retarding forces, two natural, and one artificial. The natural retarding forces or reservoirs are much the larger and by far the more important. As already indicated, in the winter months large quantities of snow fall in the Rocky Mountains and in the Sierra Nevadas. The high fierce winds that blow over the ranges and up and down the canyons, pile the snow very deep in the ravines and on the sides of the ridges protected from the air-currents. The snowdrifts often reach a depth of over a hundred feet. The temperature during the winter months falls very low in the mountains so that much of the snow is frozen into solid bodies of ice, producing, in effect, small glaciers. Where the canyons run east and west most of the drifts are located on the south side of the canyons or on the north side of the ridges. These are the valuable snow drifts for supplying water for late summer irrigation.

Located on the north side of the ridges they are protected from the direct rays of the spring and summer sun and melt very slowly; whereas those that lie on the south side of the ridges get the full power of the sun and melt early in the season. The supply of moisture thus early disappearing leaves the soil on the south side of the ridges very dry in the long months of summer. So dry does it become that nothing but scrubby cedar and dwarfed wild brush grow there. This vegetation is so dwarfed that it does not afford any shade for the snow. The snow-drifts on the north side of the ridges last very much longer for two principal reasons: first, they do not receive the direct rays of the sun; second, the high peaks and the forest trees shade them during the greater part of the day and delay the melting, and in turn the slowly melting snows afford sufficient moisture for the tree growth. The trees in turn protect the snow so that its total disappearance is often delayed until late in August.

The melting snow and ice directly feed the mountain streams. The small streamlets make their way down the hillsides in small but well established channels until they join larger and larger streams, until eventually they reach the water-course which in turn supplies the irrigation canals. The snow-drift is the first natural reservoir.

The second natural reservoir is the mountain soil itself. In fact it surpasses in importance the snow-drifts and the glaciers. Much of the water from the rains, snows, and melting ice finds its way into the porous earth. There, as it were, it is held in captivity in an immense earthen sponge. Slowly it percolates through the soil until it finds some easy exit. It enters the streams directly from the earth in small quantities by what is known as percolation or in larger quantities known as springs. The movements of this immense body of water through the earth take a long time and is a slow process, so that thousands of springs gush forth perennially.

In the northwestern Rocky Mountains and the Sierra Nevada States, these two kinds of reservoirs are great regulating forces that control the supply of water entering the greater number of the streams, so that after the early spring run-off there is a fairly constant flow. In the southwestern part of the mountain states, where these forces do not operate so extensively, there are floods that frequently destroy the canals and dams and leave stream-beds dry in early summer.

Forest and grazing management and control have done much to regulate the flow of the mountain streams, for vegetation plays an important part in the amount of water that percolates into the soil. The fallen leaves and other vegetable matter lying on the ground prevent the immediate run-off of the water derived from the rains and snow and melting ice. The roots of the trees, bushes and grass open up the earth and afford passage for the water to flow down into the soil thus impounding it, as it were, in an immense reservoir.

The denuding of the mountains of vegetation is almost fatal to irrigation, especially if the earth is tramped down compactly by herds of cattle and sheep. The mountain range lying to the east of the Sanpete Valley, Utah, is a good example of this kind of treatment. In the early days of the settlement of the valley, the mountain streams after the spring run-off were fairly constant. Naturally the streams decreased somewhat, late in the summer, but supplied the farmers depending on them. Subsequently large herds of sheep and cattle were kept on the headwaters of the streams. They overgrazed the range, destroyed the vegetation and tramped down the earth so compactly that vegetation could scarcely grow and the water could not penetrate the ground, and as soon as the hot sun began to melt the snow the floods came down in torrents, washing out bridges, destroying canals, and flooding farm lands. Even the towns themselves were sometimes submerged.

Such was the situation when the United States Forest Service took control of the forest reservation, created in 1903 in that area of the State. By proper treatment vegetation was restored and in a great measure the flow of the streams brought back to their former satisfactory regularity. Moreover, by the proper range management it has been possible to graze as many sheep and cattle as formerly and at the same time protect the flow of the water and also the growth of vegetation. The United States Forest Service has been of great value to the Western States, including Utah. In spite of the fact that it had to be forced upon the people, in many cases, it has proved of incalculable benefit.

The third kind of reservoir is artificial and of least importance, but while it is of smallest importance it is the best understood. There are thousands of artificial reservoirs in the Mountain and Pacific States. The reason for their being best understood is that they are man-made. The smaller ones are used for supplying water to households, gardens, and the like. Such as were easily and inexpensively constructed were built years ago. Many of them have been employed in water conservation in the West from the earliest times. The more substantial and larger reservoirs are structures of recent date. They are usually located in low or depressed places in the mountains or the high plateaus where by constructing a dam, a large basin is created wherein water can be held until it is needed. In the dry seasons it is turned into the natural streams or canals to be used at lower levels on farm lands.

For twenty years or more before the United States passed the National Reclamation Act (1902), the Geological Survey of the United States had conducted an extensive hydrographic survey of western streams to determine the annual run-off. Likewise and at the same time it had sought out and located a large number of the best reservoir sites in the Western States. Some of the States and Territories had engaged in similar activities, but in the aggregate the amount of work undertaken by the States did not amount to much except as supplemental to the work carried by the Federal Government. As soon as the Reclamation Act was passed this mass of valuable information became available and it was very useful to the new Service. It was employed to locate several of the best reservoirs which have since been constructed by the Federal Government through the Reclamation Service.

The work along this line has only just begun. In the future, reservoirs will play an increasing part in storing water for irrigation and also in regulating its flow. In fact, they are the great hope for increasing the irrigated area in the West, as the drifting and freezing and melting of ice and snow are beyond human control. The storage in the mountain soils can be increased considerably by proper forestry and grazing control, but there are innumerable reservoir sites and vast quantities of run-off water that can be stored only when proper reservoirs are built which will eventually be done as population increases and land enhances in value. The low price of land in this country in the past has made it economically impossible to construct reservoirs and redeem much of the best arid land. The time, however, is not far distant, with the constantly increasing price of food products, when such undertakings will be highly profitable and will also provide homes for thousands of Americans who desire, and are prepared, to remain on the land.

The storage of moisture in the high areas by freezing it into snow and ice and the retention of the water in the mountain soils and in the reservoirs is essential to successful irrigation, but of equal importance to the success of irrigation-agriculture is the development and the acceptance of a good system of irrigation-law and of irrigation-institutions. Yet in this particular, irrigation does not differ from other human activities. The effectiveness of the institutions through which these activities function determines in a large measure their success.

This study of the irrigation institutions of the State of Utah is undertaken with a view to understanding how the Mormon pioneers coped with the institutional problems of irrigation, and successfully solved them as a means of crop-production in arid America. The conditions confronting this people were almost entirely new to them. They were well acquainted with both the institutional and the cultural side of agriculture in the humid regions; but how to organize canal companies, and distribute the water among the users, or how to place it upon the land so as to produce crops were unknown problems. Here they were to get their first lessons in farming under arid conditions. Yet they journeyed across the plains, established settlements, and built up thriving communities, with irrigation farming as the physical basis of an economic and enduring stability. Moreover, a careful study of the institutions and their variations in the different parts of the commonwealth reveals the fact that it was not the work of one man or several men but the resourceful initiative of a body of frontier Americans applied to new problems, the solution of which was essential to their very existence. They were the descendants of a race that had crossed a continent and why should they be perturbed at the difficulties at hand when all others had been successfully solved? Moreover, their religious faith, which had been the cause of their exodus from the settled parts of the nation, taught them that God would care for his children. Descendants of a sturdy American stock and possessing a strong faith in the Divine, they set forth to conquer; and conquer they must.

Even the very soil itself was somewhat different from the soils they had known in humid countries and required a different treatment. In many sections, before the land could be cultivated it had to be cleared of large quantities of wild sage. Not until then could it be plowed. Either before or after the preparation of the land the canals had to be dug and water diverted from the natural streams. This was often a long, arduous, and not infrequently, a difficult task. The streams had their sources far back in the mountains and they flowed down the bottoms of rocky and rugged canyons. Where the water was diverted from the natural streams into the canals for the low-lying lands it usually involved comparatively little work; but for the higher and frequently better lands, it was often necessary to begin the diversions from the mountain streams far up in the canyons and to bring the canals along rocky side hills. This meant much work and often the costly blasting of a canal through considerable bodies of rock.

When the canals had been built, the soil prepared, and the crops planted, water was brought through the canals to supply moisture to the growing crops. Often, just when everything appeared ready for irrigation and the crops were in need of moisture, the water was turned into the canals only to find that the banks on the side hills or along some levee, immediately gave way and could be restored only at a great cost of time and labor, and then perhaps too late to be of any real value to the crops that year. The washing out of the banks of the canals, however, was only temporary where there was proper construction, for usually the snows and rains of fall, spring and winter so packed the earth that little difficulty was encountered the second season after construction.

After the water had been brought to the land, the pioneer still had difficult problems to solve. When and how often should the water be applied to the different crops and which was the best method of spreading it over the soil and bringing it to the roots of the plants?

Early experience taught him that the same method did not bring like results in different soils and with different crops. Even scientific research has not, after years of investigation and study, given the final answer to all these questions. Yet the Mormon pioneer had to find a "rough and ready" solution in order to produce food to live.

It is not contended that these problems were original with the Mormon pioneer in irrigation, for they had attended every attempt at irrigation in the arid states. Nor is it maintained that the Mormons were the first to engage in irrigation in western North America. In fact they were not. Prehistoric man undoubtedly in some crude way supplied water to famishing soil in order to promote plant growth. This was as true of North America as of other parts of the world. The ruins of vast and marvelous irrigation systems in Arizona are mute evidence of the fact that prehistoric man knew the value of irrigation and practiced the art long before the discovery of America. In the Old World, Babylon had once been a fruitful country by the application of the waters of the Euphrates and Tigris rivers to crop production. But the glory of Babylon had departed and with it most of its irrigation activities. When the West was being explored and settled, Egypt, India, Spain, and Italy were living examples of the beneficent effects of irrigation on the production of crops on arid lands.

The Pima Indians of Arizona were employing irrigation long before and likewise at the time of the discovery and the settlement of the Western States and Territories. The Spanish, already familiar with the conditions that necessitated irrigation in their native land, introduced it in their settlements of California and New Mexico. Upon the establishment of the San Diego Mission in 1769, irrigation canals were built to supply water to part of the farm crops. Other missions followed the example of San Diego. If such a policy had not been pursued it would have been impossible to supply the missions with certain necessary foods in this new environment. Soon after the establishment of the Presidio in San Francisco it was seen that if certain crops necessary for food were to be produced, irrigation would have to be resorted to. So a settlement was located at San Jose in 1782, an irrigation system established and irrigation farming on a small scale begun. In addition to supplying the community's needs a surplus was produced for the soldiers and officers at the Presidio. Los Angeles was established in 1781 as an agricultural community based upon irrigation-farming.

For a year or two, according to Bancroft, the early settlers in Oregon, led by Whitman and Spaulding, resorted to irrigation but by 1842 had given it up. They had found that by better cultivation it was not necessary in that section. The Spanish and Mexican settlers in the valley of Rio Grande, New Mexico, built canals of considerable size before 1842. They are still in use and rendering first class service. It is simply marvelous how they constructed large canals in such difficult territory and with crude or primitive implements. Where cuts were necessary the earth was loaded upon ox hides and drawn away by donkeys or oxen. The same means was employed to supply the necessary earth to build dams, dikes, or levees across ravines or other low places. The methods employed made the completion of the work slow, but through persistence water was finally supplied to the parched earth. Within the boundaries of the territory itself there were some small and primitive efforts at cultivation. John Brown in his journal p. 47 under date of August 1847, says "at Weber River we found the fort of Mr. Goodyear which consisted of some log buildings and corrals stockaded in with pickets. This man had a herd of cattle, horses and goats. He had a small garden of vegetables, also a few stocks of corn, and although it had been neglected, it looked well which proved to us that with proper cultivation it would do well."

Parley P. Pratt who conducted an exploring expedition to that region (the southern part of the basin) in the winter of 1849–50 wrote under date of January 2nd that while on the Santa Clara River that the company was piloted by Indians "who raised good crops on the river bottoms by irrigation." Addison Pratt relates that a company of emigrants going to California by the southern route in the fall of 1849 "found Indian corn fields" on the tributaries of the Virgin River. "Brother Rich reported that there were fine fields of wheat, corn and beans above us belonging to the Indians, who irrigated their lands from the streams."

If, then, the Mormons were not the first to employ irrigation in the Western World, wherein lies their attainment? Their achievements may be summed up under four heads. First: The Mormons were the first people to establish an extensive civilization in America with its economic basis resting almost wholly upon irrigation agriculture. Secondly: they were the first people to establish irrigation in Western America on an extensive scale. Third: they were among the first in the United States to develop rules, regulations, practices, customs and laws, pertaining to and governing the use of water. Fourth: they were the first to give wide publicity to irrigation. Due to their location, to the extent and the success of the undertakings their achievements became widely known and the results carefully studied. At that time the greatest highway across the continent passed through their settlements. Two years after the settlement of Utah gold was discovered in California and tens of thousands made their way overland by way of Salt Lake City. Brigham Young had advised the people to settle upon and cultivate the soil. The pursuit of this counsel for over two years had made possible a resting place and a supply station for weary overland travelers. They could replenish their food supply at this central mountain depot and incidentally observe the effects of crop production under irrigation. Utah became known to the nation and to the world. Through the efforts of the Utah pioneers a means had been discovered and successfully applied whereby the redemption of large areas of the lands of the West was made possible.

The lands immediately reclaimed by irrigation were not the only natural resources economically benefited. In addition to such lands it made possible a far better economic use of millions of acres of grazing lands. Part farmer, part rancher, the settler through irrigation could establish a home near grazing lands and graze his herds on the public lands in the summer and supply food for them during the winter from the farm. Looked at from a national standpoint the proper development of grazing lands is a valuable asset in the production of wool and meat. Moreover the food produced upon the nearby farms was economically valuable in the development of some of the most profitable mines in the world.

To the travellers the relief of this whole situation was brought out very forcibly because the Mormon settlements were bordered on the East and the West by long stretches of arid and only partially productive lands. The growth on these lands, where there was any at all, consisted of wild sage or a light crop of wild grasses so that when the weary and worn overland traveller reached the territory, the luxuriant fields and bounteous crops stood out strongly and impressively. Upon inquiry he found that the soil in the arid country was usually good, but the changed conditions, as compared with the country he had passed over, was the result of the application of irrigation water to the land.

As he left the territory, the settler realized at least partially the virtues of irrigation and became the acclaimer of the achievements of the Mormon colonizers. Utah was therefore heralded forth as the innovator and the exemplar of irrigation both in the application of water to the soil and the institutions by which it was controlled and distributed. This made it possible for her in early days to do much to introduce and establish the system which has done so much for the development of the Western United States.

CROP STATISTICS IN UTAH 1850–1910

Year	Wheat (bu.)	Oats (bu.)	Corn (bu.)	Rye (bu.)	Potatoes (bu.)	Alfalfa (tons)	Hay (tons)	Sugar Beets (tons)	Value in Dollars
1850	107,702	10,900	9,899	210	43,968	....	4,805	....	....
1860	384,892	63,211	90,482	754	141,001	....	19,235	....	....
1870	558,473	65,650	95,557	1,312	323,645	....	27,305	....	....
1880	1,169,199	418,082	163,342	9,605	573,595	....	92,735	....	....
1890	1,515,465	597,947	84,760	33,928	519,497	....	301,901	....	....
1900	3,413,470	1,436,225	169,688	28,030	1,483,570	681,515	850,962	85,914	$365,163
1910	3,943,910	3,221,280	350,020	65,754	2,409,098	791,355	1,015,913	413,946	1,858,316

POPULATION STATISTICS

Years	Population	Number of Families	No. of Farms	Improved Land in Farms (acres)	No. of Irrigated Farms	Irrigated Lands	Size of Irrigated Farms (acres)
1850	11,380	2,322	926	16,333	....	16,333	17
1860	40,273	7,473	3,635	77,219	....	....	....
1870	86,786	17,210	4,908	118,755	....	....	....
1880	143,963	28,873	9,452	416,105	....	....	....
1890	210,779	38,816	10,517	548,233	9,724	263,473	27
1900	276,749	56,196	19,387	1,032,117	17,924	629,293	35
1910	373,351	77,330	21,676	1,368,211	19,700	999,410	50

CHAPTER II

INDIVIDUAL, PARTNERSHIP AND COMMUNITY CANALS IN EARLY DAYS

On the afternoon of July 21, 1847, Orson Pratt and Erastus Snow, pathfinders for the Mormon pioneers, entered the Salt Lake Valley. The same day they made a circuit of the valley extending over some twelve miles and returned that night to the advance company which was camped in what is now known as Emigration Canyon, at a point about one and a half miles above the mouth.

CANALS

Year	Length of Canals in Miles	Cost of Canals Dollars	Cost per Acre for Irrigation
1850	....	....	....
1860	....	....	....
1870	....	....	....
1880	....	....	....
1890	....	$2,780,000	$10.55
1900	2,838	5,865,302	9.32
1910	7,709	14,028,717	14.04

The next morning early, Orson Pratt, George A. Smith and seven others continued the work of exploring the valley. The same day the advanced company moved down into the Salt Lake Valley. Orson Pratt in his diary speaks of the valley as follows: "Streams from the mountains and springs were very abundant, the water excellent, and generally with gravel bottoms, a great variety of green grass, and very luxuriant, covered the bottoms for miles where the soil was sufficiently damp, but in other places, although the soil was good, yet the grass had nearly dried up for want of moisture."

The next day, July 23, the advance camp moved on to what is now known as City Creek and began preparation for a settlement. Religious services were held for the purpose of imploring divine assistance and immediately upon their conclusion the work of settlement began. Again quoting from Pratt's diary, he says: "We appointed various committees to attend to different branches of business, preparatory to putting in crops, and in about two hours after our arrival we began to plow, and the same afternoon built a dam to irrigate the soil, which at the spot where we were plowing was exceedingly dry." The morning of July the 24th found them irrigating and on the afternoon of the same day Brigham Young and the second company which had been delayed on account of sickness entered the valley as the following quotation from Pratt's diary clearly indicates: "This forenoon commenced planting our potatoes; after which we turned the water upon them and gave the ground a good soaking. In the afternoon the other camp arrived, and we found all the sick improving very fast, and were so as to be able to walk around."

Thus we see that the very first irrigation dams and canals built in Utah were the work of cooperative activity. Except in the case of springs and very small streams, such has continued to be the policy of the territory and the State, with a few notable exceptions, until the present time.

The smaller canals in Utah were constructed by individuals or partnerships. In the early days there were very few individual or partnership canals except where the streams were small and would supply only two or three small farms. The fundamental thing to understand is that the canal in early Utah was, as a rule, a community or cooperative undertaking because not only the welfare but the very existence of the community depended upon its success.

Where the small individual or partnership canal was built it was, as already indicated, to use the water of very small streams or where the water was drawn from large streams to supply land nearby so that the water could be easily conducted to the land without much labor. Under other conditions it would have been impossible for one to four men to build a canal by their own labor.

The community or cooperative canal was the all-important means of supplying the towns and villages of the territory with water. It was fundamental inasmuch as the basic industry, agriculture, could not exist at that time, if at any time, in the Rocky Mountains without irrigation. From the first the canal was a community problem to be solved by the skill and labor of the community. When it was decided to colonize a new locality, the Mormon Church authorities not only called upon the desired number of colonists but also chose a leader for the new community, known among the Mormons as a bishop, who with his two councillors or assistants became the community leaders.

These men were not chosen entirely on account of their religious zeal, but also because of their practical ability in solving the problems connected with the establishment of a new settlement. In the construction of an irrigation system, the bishop played a leading part in getting the people together so that they could elect a committee to take actual control of the work. The bishop himself was frequently a member of the managing committee, but, if so, always by the election of his fellow-colonists. Upon the settlers also rested the responsibility of determining how much land, so far as the topography permitted, the new system would bring under cultivation. To have constructed a high line canal, covering all the good land as far up as the water would flow, would have been, in the long run, more scientific and economical, but for a body of poverty stricken colonists to have undertaken and carried out such a project with the meagre quantity of supplies on hand, would have meant starvation. Consequently it was the usual policy to construct a canal at a lower level which would supply water to a smaller acreage until more settlers came and the economic position of the community was improved and the requirements for land justified a new canal at a higher level. This accounts for the fact that, contrary to the best irrigation knowledge of to-day, several small canals at different levels are to be found supplying water to many of the fields in Utah communities.

When the colonists decided about where the canal was to be built, the duty of locating it rested with the committee, who also directed its construction. The services of a surveyor were available in some of the central communities of the territory, but in the smaller and more remote sections the distance was too great or the expense too high, so that other methods of determining the grade for the proposed canal had to be used.

A simple scheme was to fill a pan full of water and then sight over the edges along the proposed route. Some distance ahead a so-called poleman would carry a pole on which was marked the height of the top of the pan. Bottles filled with water attached to a piece of square-edged timber and spirit levels were all used in the manner mentioned. By these instruments it was comparatively easy to tell whether the water would flow in the proposed canals. It was, however, difficult to secure the right grade, consequently the movement of the water in many of the early canals, is quite irregular at different places. In some parts of the canals the water flows very slowly and in other places very rapidly, washing away the soil until a hard formation is reached there creating a water fall. It must be borne in mind that all the early canals were gravity systems. The mountain streams from which the canals are supplied are fed by flood waters, mountain springs and melting snow. The first canals built had their sources some distance below or near the mouths of the canyons. Later canals were built at much higher levels in order to irrigate the plateaus or foothills of the mountains. The intake of such canals necessarily extended several miles up the canyons.

There are no great rivers in Utah, and when we speak of large streams it is only a comparative term. Often the small streams were appropriated by individuals or partners, but the diversion of the large streams necessitated the united efforts of a community, the water was employed to supply larger areas of lands in nearlying valleys. Contrasted with the large systems of India or the reclamation projects of the United States, these early systems were small, but at the same time many of the canals were from ten to twenty miles in length. Along the main canal below the mouth of the canyons, laterals or branches were built to supply the different areas of land lying below the main canal. These laterals were further divided until it came down to the individual ditch of the farmer using the water. In the light of more modern methods of construction, where all the users of a system assist in construction of the canal from its source to the end, there is an interesting feature in these early Utah canals, which were cooperative undertakings. The lands of a valley were divided up among the different settlements and while a resident of one town may occasionally own land in the field of a neighboring town it was not a common thing. It did, however, often happen that a canal was built to supply water for the fields of two or more towns. All towns interested worked upon the canal from its source up to the point where the lands of the first town ended; then an accounting of the work done was had and the water divided accordingly between the different towns. At that point the first community would quit work and the construction would be carried forward by the remaining communities in the same manner to the completion of the canal, each succeeding town dropping out as its limits were reached.

In the northern and central parts of the State the streams generally flowed down the rugged canyons on rocky beds, and it was comparatively easy to construct a diverting dam. All that was necessary was to cut willows and fill the stream with them and with rock and earth. Gradually the floor of the stream would be raised until the water would flow into the canal. In the southern part of the State, the soil is sandy and the streams come down in floods cutting deep channels and frequently changing their courses. The task of building permanent dams under such circumstances and with the materials at hand is almost impossible. Almost every spring the old dams were washed away and new ones had to be built. As the years go by, there is a strong tendency to supplant the rock and wooden dams by more substantial strictures such as masonry and concrete.

In many places in the canyons in constructing the upper parts of the canals the soil was so rocky and steep that it had to be removed by picks, spades and shovels. Frequently the canals had to be brought along mountain sides where the rock had to be blasted away. The foregoing does not refer to extreme cases, for there are numerous cases where it required four or five months a year for three or four years to blast away the rock, the remainder of the year being spent by the settlers away from home working for bread to support their families until the water could eventually be brought to the land. The rocky parts after the canals had been constructed generally caused considerable trouble because the water would seep out as fast as it would run in, so that clay had to be hauled in wagons and filled into the crevices where the water was escaping. This was done in various ways. A common practice was to distribute the clay soil over the bottom of the canal as evenly as possible and turn the water in. The water itself would have a strong tendency to force the fine clay soil in to the openings where the water escaped and thus close them. To assist in the process, oxen were often driven up and down in the canal while the clay was wet or even while the water was flowing in the canal. The loss of water through these rocky and gravelly formations was so great, in certain canals, that is was with extreme difficulty that any water was made to flow through during the first season, causing a loss of all or a large part of the crop by drought.

Down in the valleys where it was possible, it was common to plow the canal the entire length and to turn the furrows out so that the dead furrow would form the center of the canal. When this was accomplished, two yoke of oxen would be hitched to a loaded "go devil" and it would be drawn along and through the proposed route of the canal, pushing the plowed dirt out on the bank. Where this could be successfully done it saved much shovelling. In some cases, it was possible to plow the canal two or three times and have the "go devil" drawn through after each plowing. A "go devil" was made by taking two pieces of plank twelve or fourteen inches wide and from five to eight feet long, the exact length being determined by the size of the implement desired. The planks were fastened together in such a way as to form a A. The point of the implement thus formed was the nose or front and the part to which the team was hitched. The planks were kept apart at the rear by means of braces. Much of the soil could not be removed by the "go devil," and it had to be shovelled out by hand labor. In a great many cases it could have been more easily removed by scrapers but the early settlers did not have scrapers and could not financially afford to buy them even if they had been obtainable. In the crossing of ravines or low lands, it was frequently necessary to build levees in order to carry the water across. Wagons were used to haul soil to make fills but very often, owing to the lack of proper implements, most of this kind of work had to be done by laborers with shovels; this was a slow and laborious method.

In the construction of the early canals, very little attention was given to drainage and as the years have gone by, thousands of acres of excellent soil formerly irrigated and cultivated, have become water-logged and useless as alkali has risen to the surface to such an extent that vegetation will not grow.

During the time of construction, a committee elected by the land claimants was in control but when the canal was completed the committee was released and a water-master was elected to control. His term was for a year and he was paid so much per day for the actual time employed. All the settlers were poor and wages were low. They paid the water-master at the rate of about two dollars a day for the actual time engaged in canal service. If it was necessary to use a team the pay was slightly increased. The duties of the water-master were to see that the water was kept in the canal; to prevent the canal from breaking and to call out the irrigators to repair it if it did break; to notify each irrigator when it was his "turn" or time to use the water and also when his head gate at the proper time was to be shut down. During March or April he called the irrigators together to receive a report of the past season.

The legislature in granting charters to the towns to form municipal corporate organizations frequently included in the charter the right to control all canals and streams flowing through their corporate limits. In such cases the mayor or council of the town appointed the water-master.

In the communities of Utah, irrigation water was used in rotation. Rotation is the most economical way of using water especially where a continuous flow would give such a small stream that it could not be successfully used to flood the land. The plan generally followed was to allow so much time for each acre or water right held by an individual or so much time for every dollar invested in constructing the canal. It was ordinarily arranged that the turns should be from one to two weeks apart. This was also determined at a general meeting of all the irrigators or by the water-master.

The cleaning and repairing of the canals had to be performed every spring. At the spring meeting ordinarily a committee of three was appointed to estimate how much it would cost per acre. Two methods were pursued: First, the cost per acre irrigated or per dollar for construction was estimated and the wage for a man or a man and a team was fixed. Then beginning at a certain day at the head of the canal, the work was continued under the supervision of the water-master until the canal was cleaned or repaired. The other method was for the committee to divide the canal into stints and to notify each irrigator of his stint. A certain day was set for the work to be completed. It was the duty of the water-master to see that it was properly done. As a rule the farmers did the work themselves and very little labor was hired. The same methods in the main prevail up to the present time.

It has been said by some writers that thousands of canals built in Utah belong to the communities. This is true if the meaning is understood. They did not belong to the community as a corporate body but in the sense that each settler was the owner of land and in order to secure the necessary water to make it fruitful he had to own a share in the canal, which he secured, as a rule, by his own labor. Because early settlers were poor, hired labor played practically no part in canal construction. Each settler possessed a small farm and that made close settlement possible and supplied the necessary labor to build canals. If the settlers had been allowed to claim all the land they wanted the territory would have been held by a comparatively few people who, poor as they were, could not have supplied the labor to take out the water and the soil would have remained sterile and fruitless and a shortage of food would have prevailed. With the close settlement plan the farmers supplied the labor themselves to build the canals and reclaim the land. So that the thousands of miles of canals of early Utah were built without bonded indebtedness or indebtedness of any kind. They were built by the farmers, owned by the farmers, and operated by the farmers. In fact they constitute one of the greatest and most successful community or cooperative undertakings in the history of America.

In 1910, out of a total irrigated area of 999,410 acres in Utah, individual and partnership canals irrigated 222,448 acres, and cooperative canals, 687,260 or 91.1 per cent. of the entire irrigated area of the State at a cost of $11.22 an acre. The average size of these irrigated farms is 32.9 acres.

CHAPTER III

LAND SYSTEM

The area included within the boundaries of the present State of Utah was part of the territory acquired by the United States from Mexico in the war of 1846. At the close of the war the territory taken by force of arms was permanently ceded by the treaty of Guadalupe Hildalgo to the United States. For two years the United States failed to provide any form of civil government for its new possessions. Left to their own resources the pioneers of Utah, being of one religious faith, submitted to ecclesiastical authority. Efficient as was this authority it soon became obvious that it was not sufficient to meet all the demands of a new community so a convention was called March 2, 1850, to frame a constitution for the State of Deseret and the Congress of the United States was petitioned to admit the territory as a state.

On September 9, 1850, Congress passed an act providing civil government for this vast western domain that was so little known and less appreciated. By this law California was to become a State and the remainder of the territory acquired from Mexico was divided into two territories, New Mexico, including part of the present State of Arizona on the south, and Utah on the north. The boundaries of Utah extended from the summit of the Rocky Mountains on the east to California on the west and north from the thirty-seventh parallel to the southern boundary of Oregon, embracing the present States of Utah, Nevada and parts of Colorado and Wyoming.

As already indicated, when the Mormons entered the Salt Lake Valley, July 21, 1847, it belonged to the United States and theoretically the territory was under the control of the military authorities of the United States, but practically no effective governmental authority existed. The army was hundreds of miles away and the Indians and coyotes held undisturbed sway over the mountains and valleys, except for an occasional visit of a fur-seeking band of trappers and hunters.

Even after Congress had established a territorial government in Utah, it was many years before any provisions were made to satisfy the claims and extinguish the rights of the Indians to the lands occupied by the whites, or to extend the Federal Land Laws to the territory for the benefit of the settlers. In the eyes of the Indians, the whites were mere trespassers without treaty rights and in the eyes of the law the whites were mere squatters. Yet they were diverting the streams, cultivating the lands, erecting dwellings and preparing a permanent abode for themselves and their children for all time.

The Indians in the Salt Lake, Provo, and Weber valleys were of a very inferior type and possessed but small power of resistance, but farther south and north they were of a higher grade and resisted much more strongly the intrusions of the white settlers who had come to occupy their lands. Brigham Young, as United States

Indian agent, entered into treaty relationship with them so far as his power extended and secured several concessions of territory from them. Even the constitution of the State of Deseret did not contain a provision giving to the General Assembly any authority over the land, water or timber in the new commonwealth. Perhaps the makers realized that the land at least belonged to the Federal Government and could not be disposed of by the new state government even if it were admitted, unless express authority was granted to do so in the enabling act. Congress passed an act establishing a territorial government in Utah, and the President approved it September 9, 1850. The act was part of the Compromise of 1850, but like the constitution of the State of Deseret it failed to grant the territorial legislature any authority over land, water or timber. Yet as we shall see, the governor and legislative assembly exercised great if not unrestricted power over these natural resources. It is difficult, if not impossible, to determine how much authority the territorial government felt itself legally possessed of in respect to the disposal of the waters, the streams and of the other natural resources, but it is certain from the very initiation of a form of civil government that it was recognized that grants of lands made by it were subject to the superior title of the Federal Government and that the occupants of land were legally only squatters or claimants. It is doubtful whether the same doctrine held true in regard to water and timber. At all events, the inhabitants were allowed to consume the latter and use the former subject to certain restrictions.

From July 24, 1847, the date of the entrance of the pioneers into Salt Lake Valley, to April 1, 1869, a period of almost twenty-two years, it was impossible to locate upon a piece of land according to the land laws of the United States or to undertake to secure title to it through a government patent. The office of the Surveyor General of Utah was created Feb. 17, 1855 and D. H. Burr was appointed to the position March 13, 1855, but on June 30th, 1862, the Utah and Colorado offices were consolidated and the records moved to Denver. The office was not opened again in Utah until October 5, 1868, and a United States Land Office was not open for business until April 1, 1869.

In the absence of legal provision by the Federal Government for the supervision and distribution of natural resources, some system had to be maintained by the existing authorities. The Mormon Church, a compact and thoroughly organized religious association, had been in existence long before the pioneers entered Salt Lake Valley. In fact, it was the only government in actual control during the crossing of the plains and for many months after settlement in Utah. From July 24, 1847, to March 15, 1849, no form of civil government was in existence, yet all the transactions involving the usual authority of governments were being exercised in an orderly manner under the jurisdiction of the Mormon Church. Naturally such authority could properly apply only to the adherents of the faith and by 1849 there were numbers in the territory who did not belong to the Mormon faith, so steps were taken to organize a state government in the hope that Congress would admit it into the Union. On March 14, 1849, the State of Deseret was organized and although not recognized by the

Federal Government continued to exist until superseded by the new government.

Neither the Mormon Church organization, the State of Deseret nor the territory of Utah claimed any more than temporary or emergency jurisdiction over the lands of the territory, pending some action of Congress. As already pointed out, the only authority in existence for many months after settlement began was the Mormon Church and, it was only natural that this organization, in the absence of any other, should set itself to the task of organizing a system of colonization that would be both successful and harmonious. If the economic forces were not controlled, they might very easily lead to such a state of discord as to disrupt the religious association and render the great exodus futile.

The plan on which Salt Lake was laid out was the model to be followed in other settlements, with the result that most Utah towns have the same general system or arrangement. A description, therefore, of the methods pursued and the plan adopted for one will apply to all. The scheme was successful, but there is such a likeness in the plans of Utah towns as to tire one who is accustomed to variation in city or town planning.

When the Mormon Church authorities determined upon a new colonization project, a location was selected, leaders were appointed from among the ones experienced in colonization; and a sufficiently large body of colonists to protect themselves against the Indian menace and to construct irrigation canals were called to locate the new town. They were expected to move in a body, and did so.

The place chosen for the town was usually on or near a stream in order to secure the necessary irrigation water. The tendency, which almost amounted to a rule, was to locate the town on or near the foothills of the mountains adjacent to a stream, having in mind at the same time the necessity of conveying water by gravity canals to the townsite. Ordinarily, about a half of a mile to a mile square was reserved for the town site. Streets running north and south and east and west were laid out at right angles and at such distances apart as to make town blocks of ten acres each. A block was divided into eight lots containing approximately one and a quarter acres each. A lot was supposed to be large enough to provide room for a residence, a vegetable garden, a family orchard, and barns and outhouses. The idea back of it all was to establish a village community system. Between the streets and the sidewalks small ditches were dug to supply water to the gardens and sparkling streams of pure mountain water were permitted to flow down the courses. Near them shade trees were planted which in time contributed to the comfort and beauty of Utah towns and villages. The compactness of the village was necessary in order to protect the colonizers against the attacks of Indians who in early days were always on the alert to steal the live stock and in many instances to kill the whites. This danger often led to the erection of a fort in the center of the town. Moreover the compact village community made access easy to the meeting house where religious services were conducted and amusements carried on. The religious element is a very important one to consider in the growth and development of Utah and without understanding it, neither the colonization nor the social and economic problems of the State can be fully comprehended.

The lands immediately adjoining the towns and subject to irrigation were divided into five- or ten-acre plots, although in some cases the plots were made larger or even still smaller. Enough of the small lots were laid out to supply each settler with one and to leave a sufficient number over to supply settlers coming later. Just beyond the area divided into five or ten acre lots the irrigable land was divided into ten acres, twenty acre farms and finally in a few cases into forty acre farms. Of necessity the plan was not carried out with absolute regularity in all towns because the times of settlement differ and the natural conditions varied considerably. In the older parts of the State, the major part of the cultivated lands near the towns is still held in five, ten, and twenty acre pieces. In some cases, depending on the nature of the crops produced, the acreage held by the farmer has proven too small for economical cultivation and there has been a slight tendency to buy each other out and combine so as to make larger units. The Church authorities would not permit speculation in land in the early days, and a man was not allowed to claim all the land or pieces of land that he wanted. A single man who had attained his majority or a head of a family was limited according to the needs of those dependent on him. In an allotment the amount of irrigable land in proportion to the population was also taken into consideration and a just distribution made, even though it meant a smaller acreage for each holder. When a higher line canal was taken out additional allotments were made. Twenty to forty acres were the total amounts usually allowed.

If there were lowlands in the valley where wild grass grew sufficiently tall to cut, each settler was allotted a portion of this land in order to provide feed for his animals during the winter. These wild hay lands usually lay along the sloughs and streams where the flood or the spring waters overflowed and moistened the ground so that the wild grasses grew from one to two feet high. The higher farming lands were usually so dry, until they were irrigated, that grasses could not be grown upon them.

A common herd ground, which was subject to approval by the County Court after 1852, was set apart for the community. On these grounds the milch cows, young cattle and unused oxen were herded by a town herdsman during the day, in the summer months, to be returned to their homes for the night, otherwise the Indians would steal and slaughter them all. In early days before there was sufficient forage to feed the work animals in the barns they were sent to the herd ground at night accompanied by one or two or more armed guards to prevent their being driven away by the Indians who were always alert and often successful in stealing whole herds of cattle or horses.

Not only the success but the very existence of the settlers depended on their ownership of the land and control of the waters of the territory. Yet the land belonged to the Federal Government and for all they knew it might also assert jurisdiction over the water. Naturally they felt apprehensive over the situation because while the ecclesiastical authorities could divide up the land, they could not insure any kind of title to it. An act of the territorial legislature of 1852 placed the entry of the public lands under the jurisdiction of the County Courts in the several counties. So that after this date any disposition made by the church authorities was subject to the approval of the County Court. However as the same men exercised authority in both fields little conflict occurred.

As already indicated, the Enabling Act of the territory did not grant the territorial legislature any authority or control over the disposal of the lands in Utah, but in the frequent changes and transfers which will naturally take place in a new country it was imperative that something be done to protect the men who were redeeming and cultivating the soil and likewise those who purchased improvements. In the absence of any action by Congress it was better for a legislature to usurp control, pending legislation by the proper authority, than for none to exist. On March 6, 1852, the legislature enacted the following provision:

> "When any conveyance, sale, or transfer shall be made of any legal claim, or right of possession of any city lot, or surveyed lands or land, part or parts thereof within this territory, the seller or vendor of the same shall make and execute to the vendor a full and written quit claim, and possession to the premises so transferred, and acknowledge the same before the county recorder where the premises are situated."

On January 18, 1855, the legislature provided for the transfer of all land claims whether surveyed or not. On January 2, 1861, the territorial legislature passed an act concerning the ownership and control of land. Section 1 reads as follows:

"Any person who has inclosed or may hereafter inclose a portion or portions of unclaimed government land, or cause it to be done at his expense; or has purchased or may hereafter purchase such inclosure; or erect, caused to be erected or purchased any building or other improvement thereon, or may hereafter do so is hereby declared to be the lawful owner of the claim to the possession of such inclosed land, and the lawful owner of the improvements thereon and thereunto appertaining; and they shall be so deemed and held in all legal proceedings and in all rights and doings pertaining or relating to the aforesaid property."

The act further provides for every form of legal protection afforded the owners of land in fee simple. The idea back of it was to define as clearly as possible the claims of the various settlers so as to minimize "land jumping." This was accomplished by requiring the claimants to fence their claims. Fencing was also a practical means of limiting the size of the claims. It was impossible to lay claim to any large amount of land as long as it had to be inclosed by a pole fence since the labor of cutting the posts and the poles, hauling them from the mountains and setting them up was too great for pioneers who were at the same time engaged in planting and harvesting crops on which to live.

In the settlement of a new country frequent changes of location take place. When settlers possess title, they can transfer to new settlers or where they legally enter government land they can relinquish and the new settlers can reenter the land under Federal laws. But in the case of the Utah pioneers they neither owned the land nor could they enter it under the Federal laws, yet there were frequent transfers by sale. In order to protect the purchasers of these claims the territorial legislature of January 18, 1855, provided that all transfer of land claims must be made by quit claim deeds witnessed by two competent witnesses and acknowledged before some person authorized to take acknowledgments. The quit claim deed was then to be properly recorded in the office of the county recorder.

The Pre-emption Act had been in force some six years before the Mormon pioneers entered the Salt Lake Valley. It provided for the entry of not less than forty nor more than one hundred and sixty acres. After fourteen months of residence and the payment of one dollar and twenty-five cents an acre the entryman could prove up and receive a patent from the United States Government. The act applied only to heads of families or persons over twenty-one years of age.

Like much of the land legislation the Pre-emption Act was unsuited to the arid regions and especially to Utah. The minimum area was too large for the small subdivisions of farm lands in Utah. The territorial legislature memorialized Congress to amend the act so as to permit of the entry under it of areas as small as five acres. The residence requirement was difficult of fulfillment considering the hostility of the Indians. In many parts of the territory, to move out on the farm lands and away from the fort or village meant certain death. The Federal Government had given the Oregon pioneers their lands and the legislature petitioned Congress to pursue a similar policy toward the Utah pioneers but the request was not granted.

In 1862 Congress passed the Homestead Act, which provided for the entry of 80 to 160 acres. The entryman was required to reside upon the land five years.

This did not suit the Utah situation as well as the Pre-emption Act, if the provisions were to be strictly adhered to. But at the time nothing could be done under either act because the United States had not established a land office in Utah and very little of the land had been surveyed.

In March, 1869, a United States Land Office was established at Salt Lake City and on April 1st, claimants began to enter the land which many of them had cultivated for over twenty years. It is an interesting bit of history to know how this was accomplished under the existing land laws of the United States, considering the small areas claimed by the Utah farmers. In many instances, from sixteen to thirty claimants were in possession of a hundred and sixty acres of land; especially was this true when the land lay near a town. The plan followed was for the interested parties in any given quarter section to meet and determine under which law they should attempt to secure title. After this was done, one member of the claimants was chosen to enter the land for the benefit of himself and the others. Sometimes the agreement included an understanding that the entryman in addition to securing title to his own claim should be compensated for the loss of his homestead or pre-emption right as the case may be.

All of these arrangements, legally speaking, were void and a strict interpretation of the law would preclude the final proof of the entry. Moreover, the entryman neither in the case of the Pre-emption Act nor under the Homestead Act made any pretension to establishing a residence on the land because, in practically all cases, their homes were already fully established in the town to which the lands usually lay adjacent. The most that was done was to build a small cabin of lumber, or logs, on some part of the quarter-section. It was not infrequent for the several entrymen of a section to unite and build a cabin in such a position that each corner of the cabin should rest on a corner of a quarter-section. Occasionally the entrymen would sleep in the cabin. The expenses of entry and final proof were divided among the occupants according to the land held, and when final proof was made and the patent issued from the United States Government the holder of the patent deeded to each occupant the land he had cultivated. If compensation had been agreed on for the entryman in view of the loss of his right, principally in favor of others, it was paid at the time the transfer was made. It was almost an unheard of thing for the holder of the patent to fail to transfer the land to the occupants.

The only thing to be said for this violation of the land laws of the United States was that it was done with the full knowledge and at least the connivance of the United States officials and not with the idea of speculation or fraud against the government but to secure title to the soil that the pioneers had reclaimed and made productive by irrigation. The failure to live on the land was merely a technicality as they were really homelands and the owners lived in the nearby communities.

CHAPTER IV

WATER LEGISLATION 1849–1880

The pioneers of Utah were natives of the Eastern or humid parts of the United States and were naturally familiar with the water laws of those regions. These laws had originally come from England with the British colonies where the problem was one of taking water from the land rather than bringing water to it. The physical conditions in the Eastern States where the colonies first settled were similar in respect to humidity to those in the mother country. In each, therefore, the law of riparian rights obtained. It might have been expected of the pioneers of Utah, Anglo Saxons as they were, that, in line with their bent of mind, they would be apt, and would at least attempt, to introduce the same system into the new territory.

To see what a calamity such a system would have been it is only necessary to consider briefly the law of riparian rights. According to the provisions of this system the riparian owner of land bordering on a lake or stream, is entitled to have the stream flow on as it was wont to do, and to have the lake remain as nature placed it. In other words, the riparian owner of land had a right to have the water flow undiminished in quantity and unpolluted in quality. In the words of the celebrated California case of Lux vs. Haggin, decided in

1884, which fixed on the State of California the doctrine of riparian rights, the Supreme Court of the State said: "The right of the riparian proprietor to the flow of the stream is inseparably annexed to the soil, and passes with it, not as an easement or appurtenance, but as a part and parcel of it. Use does not create it nor disuse destroy or suspend it. The right in each extends to the natural and usual flow of all the waters, unless where the quantity has been diminished as a consequence of the reasonable application of it by other riparian owners for purposes hereafter mentioned. The right of enjoying this flow without disturbance or interruption by any other proprietory is one of jure nature and is an incident of the property in land, not an appurtenance to it, like the right he has to enjoy the soil itself, in its natural state unaffected by the tortuous acts of a neighboring land owner. It is an inseparable incident to the ownership of the land, made by an inflexible rule of law an absolute and fixed right and can only be lost by grant or twenty years of adverse possession."

This is the law of riparian rights as generally recognized and applied; an unsound principle for an arid state was fastened on California by its own supreme court, years after its admission into the Union and after a long and varied experience with its own arid conditions. For such a learned body to render such a far-reaching and important decision based on precedent and on a so-called law of nature, instead of on the inherent needs of the arid region, when it is realized that it could apply only in analogous conditions which were almost entirely absent in the State, was legal blindness. No one knows what the law of nature means, and the best thinkers of the world maintain that there is no such a law. For the Supreme Court to base such a far-reaching decision on such a vague foundation was, to say the very least, an evidence of poor thinking.

In contrast with this notable decision the action of the leaders of the pioneers of Utah, in absolutely abrogating the doctrine of riparian rights, and acting, in the main, on the theory that the waters of the streams and the lakes of the territory belong to the public and are subject to appropriation by individuals or to grants by the legislature or subordinate bodies created by it, shows a far keener appreciation of the needs of the arid regions. The doctrine adopted for the economic and beneficial use of water is certainly a remarkable advance. It is also indicative of much of the wisdom, sagacity and initiative of these men in solving many practical problems attending the colonization of an entirely new and untried country. It is not to be assumed that when the old system was abolished, a new one, full and complete, immediately sprang into existence. Neither were the underlying principles of public ownership and control or economic and beneficial use always persistently and consistently followed. It was an honest attempt, however, to build a system of water law and custom that would suit the arid region.

For more than three years before the territorial government was established and almost two years before the State of Deseret was organized, so that laws could be enacted, the doctrine of the diversion of waters from streams for economic and beneficial use was the accepted policy approved by the leaders of the Mormon Church, the controlling force in the early settlement. By the time legislatures had come into existence prepared to pass laws and make grants the feasibility of the new system was beyond question. Fundamentally it was the application of the law of self preservation. The adoption of any other doctrine would have made impossible the colonization and settlement of the lands of the Rocky Mountains and the Great Basin. No legislative act of the territory of Utah was ever passed which specifically abrogated the doctrine of riparian rights pertaining to waters nor specifically adopting the doctrine of appropriation, yet all the early legislation was based upon and adopted the new theory. The legislatures not only acted on the theory itself, but expressly delegated the same power in the first session of the territorial legislature to the county courts of the several counties. Section 39 of an act defining the powers of this court, approved Feb. 4, 1852, says: "The County Court has the control of all timber, water privileges, or any water course, or creek to grant mill sites, and exercise such power as in their judgment shall best preserve the timber and subserve the interest of the settlements in their distribution of water for irrigation or other purposes. All grants or rights held under legislative authority shall not be interfered with." By this it is plain to be seen that the power granted to these local county courts was extensive and was based on the same theory of public ownership of water as was acted upon by the legislature itself. A discussion of the exercise of this power will be presented in a separate chapter.

In order to comprehend clearly the development of the law and practices in the use of water as developed by the early settlers, specific grants will be considered. In many cases where legislative grants were made, the projects were not completed and in some instances not even begun because of the lack of financial resources but they will be recited because they embody certain fundamental doctrines. The chief proposition and the one on which all others rest is that the State (Territory) owns and thereby has a right to control the waters within its boundaries, in so far as they are not interstate streams. As subdivisions of this main proposition there are six principal heads: the right to grant preference of use for irrigation; the right to grant a restricted use for power purposes, as in the case of flour and saw mills; the right to limit the amount of water a person or corporation can appropriate; the right to prescribe the territory where the water shall be used; the right to fix the place of usage or the point of diversion which shall not be changed save by permission of the same power that made the grant; the right to authorize canal companies to sell water; and the right to reject or revise the grant at the pleasure of the granting power where the flow was too great or not sufficient or not needed.

As early as December 4, 1850, the General Assembly of the State of Deseret passed an act which provided, "That Ezra T. Benson is hereby granted the exclusive privilege of controlling the waters in Tooele Valley, Tooele County, known as Twin Springs, also the waters that issue from a spring called Rock Spring in said valley and county for mills and irrigation purposes." On the same day a similar act was passed providing "That Brigham Young have the sole control of City Creek and

Canyon, that he pay into the public treasury the sum of five hundred dollars therefor."

Here are two grants in which exclusive control of the entire streams was given. No argument is presented to show that the grants were not excessive because they probably were, but when usage is based on a franchise the amount can be revised to the actual needs. Heber C. Kimball was granted the privilege of conveying the waters of Mill Creek to a convenient point " and appropriating them to the use of a saw mill, a grist mill and other machinery." Section II of the same act provides that " Nothing herein contained shall prevent the waters aforesaid from being used whenever and wherever it is necessary for irrigating." Here again we have a restricted use of the water for power purposes with a preference right for irrigation. These grants were afterward confirmed by territorial legislation.

On February 3rd and 4th of 1851, Willard Richards and Brigham Young respectively were granted the waters of Mill Creek for irrigation and power purposes, but Brigham Young was to divert the water below Neff's Mill. February 18, 1852, the inhabitants of Dry Creek in Utah County obtained the right to take out one-third of the waters of American Creek for use of the Dry Creek settlement and for the purpose of irrigation. In this instance the legislature restricted the amount of water to one-third of the stream and the water was to be used by the settlers of Dry Creek settlement. Here we have a limitation of the amount of water that can be appropriated in fractions of the stream. It has, however, the distinct disadvantage of giving title to the early waters beyond the actual need and raising a legal barrier to the storage of the spring run-off reservoirs. The territory where the water was to be used, while not limited in detail, is limited in general to the settlement, which, probably, is as far as it could be carried at that time.

The Provo Canal and Irrigation Company was incorporated by the legislature, Jan. 17, 1853, and granted the usual powers of a corporation. With special reference to irrigation, navigation and power it was authorized to divert one-half of the waters of Provo River as near the mouth of the canyon on the north side of the stream as possible. The act says that the directors shall have power to sell stock and " to use water for the irrigation of lands, for mills and machinery of any kind and for navigation and for all other lawful purposes whatsoever. It may sell, lease, and dispose of the same or any portion thereof for any of the above purposes."

This is the first irrigation corporation organized in the State, and as the incorporators were not citizens of Utah County and furthermore since they were authorized to sell water or power, it is possibly the first commercial charter granted in the territory.

On January 19, 1854, the territorial legislature passed an act authorizing the construction of a canal from Utah Lake to Salt Lake City, approaching very closely the idea embodied in making water rights lien on the land, considering the fact that the occupants in the territory did not possess title to their lands. It also embodied as far as possible the idea in the Carey Act passed by the Federal Government in 1894, requiring new settlers to assume the burden of canal construction upon entering lands under the canal subject to water. The canal was to connect Utah Lake and Salt Lake and to supply water for irrigation, navigation and power. The commission to have charge of the work was named by the legislature. The act itself named the course of the canal in general requiring that it run to the west of the Jordan as near the base of the mountains as possible. The definite location is left to the commission. The canal was to be of sufficient depth and width to carry boats drawing water two and one-half feet deep and twelve feet wide. Locks were provided for. The act also provides that the commissioners "shall survey the lands which may be benefited by the construction of said canal, upon each side thereof; likewise take into consideration the benefit arising to present holders of land claims, and apportion the land claims according to the estimated expense and cost of said canal." This is an early recognition of the fact that men will take up land and hold it without purchasing water rights until the company is bankrupt in the hope that water can be purchased at bankruptcy prices. The legislature attempted to protect the corporation from such conditions. This is an early recognition of the principle embodied in the irrigation district organization. So far as its authority extended the law also required new settlers to assume their proportion of the burden. The weak part of the whole scheme was that the settlers did not have title to their lands and the territorial legislature had no authority over the disposal of Federal lands. In case the settlers refused to pay their share the only alternate was to refuse to deliver water which the act authorized the company to do.

The authority for a lien on the land was lacking but a careful study of the law leaves no doubt that the idea was present in the mind of the legislative body.

The Cottonwood Canal Company was incorporated by legislative enactment Jan. 15, 1855. The company was authorized to construct a canal on the east side of Salt Lake Valley for irrigation, navigation and power. It was also authorized to divert one half the water of Cottonwood Creek. The corporation was to have the entire control and management of all waters thus taken out and may use the same for the irrigation of lands, for mills and machinery of any kind and for navigation and all other lawful purposes whatsoever and have the right of way for two paths and access to and from the same; and may sell, lease and dispose of the same or any portion thereof for any or all of the above purposes on such terms and on such conditions as the parties may agree. The idea back of this project seems to have been commercial and fundamentally at variance with the general practice of the territory.

On December 27, 1855, the legislature granted to Aaron Johnson and others "whom they may associate with them, authority to take one third of the waters from the warm stream of Spanish Fork City and convey the same in the best possible route to a tract of land known as Springville survey, and contract the same for irrigation purposes during the purposes (pleasure) of the legislature." This is in fact a mutual company although it takes on the form of a corporation. It designates the amount of water that may be diverted and the locality in general where it must be used.

The Jordan Irrigation Company was chartered by the legislature, January 17, 1862, to take water in both sides of the Jordan River about one half mile above North Temple Street (amended on Jan. 7, 1865, to twelve miles) for irrigation or power. The organization was given the usual form and powers granted a corporation. It has a board of directors authorized to sell or lease the water and power and to levy and to collect a tax upon all lands benefited by the waters of the system. The company was also authorized to sell stock to carry on the work. The stock-holders were entitled to vote and enter into the control of the corporation. This has all the features of a regular stock water company but has in addition a peculiar provision which permits taxes to be levied upon the lands benefited but does not provide that tax payers shall have any voice in the company unless they purchase the stock, an obviously unjust provision.

A general provision for the incorporation and organization of Irrigation districts was embodied in the Act passed January 20, 1865. The provisions of the act and its working will be treated in a separate chapter.

The last one of these special acts creating irrigation companies was enacted January 18, 1867. This was probably due to the fact that Congress passed a law prohibiting territorial legislatures from granting charters by special act. It required that such grants should be by a general law and open to all. The Deseret Irrigation and Navigation Company was granted a charter upon the above date. It was organized according to the usual form of corporations and with ordinary powers. Its particular purpose was to build canals for irrigation, navigation, and power purposes. It was authorized to sell a million dollars of stock if necessary which was to be "deemed personal property." This stock was to be used for the construction of canals, and gave to the holders a vote in proportion to their holdings in the election of directors and in the general management of the company. The size of the main canal was to be at least three feet deep with a width of twenty feet at the bottom with exceptions where there was a rapid flow. It was authorized to sell water and power and conduct a system of transportation by water.

These corporations organized by the legislature with power to build canals and sell the water are notable exceptions from the thousands of mutual canals constructed by the farmers themselves to secure water to irrigate their own farms. As a rule these corporations were intended as commercial enterprises.

The foregoing illustrates the number of large projects contemplated, most of which were never undertaken. In fact, for twenty years only small ditches were constructed and that seems to have been the reason why the irrigation district act was passed. To encourage construction of large canals subsidies were granted by the counties and the territory. January 30, 1852, the territorial legislature at its first session passed an act providing that "The Territorial Road Commission is hereby authorized to draw from the public treasury any moneys not otherwise appropriated, to the amount of two thousand dollars and proceed forthwith to lay out the same for the completion of the Big Cottonwood Canal." Again in 1853 another act reads: "The Territorial Road Commission is hereby authorized to draw money from the public treasury and expend it for the completion of the Big Cottonwood Canal and keep a correct account of all moneys thus expended and yearly present it to the auditor of Public Accounts, on or before the first day of October until said Canal shall be completed." Thus in the very beginnings of the new territory it began to subsidize irrigation, something that every nation has had to do where irrigation is essential to agricultural growth.

Little new legislation was passed from 1865 to 1880. The law of 1880 in form was a lawyers' act and a marked step in retrogression. For nearly thirty years the territory of Utah, in so far as any law was applied, had controlled its water resources under the law of 1852, which was the embodiment of the early ecclesiastical requirements of the early settlers and also the customs which had developed in the use of water. The act of 1852 gave extensive powers of water control to the county courts of the respective counties. This power had been fully exercised in Salt Lake County and in a less degree in Weber, Utah, Davis, Box Elder, Sanpete and Cache counties, but in the more remote counties not at all. This was perhaps due to the fact that there was plenty of water and few settlers. It did, however, grant to each county court the authority, and as time went on, if not repealed, would have been fully exercised. The act of 1852, as already indicated, gave the county court full and complete control over the waters within the county. The idea was for the court to control the waters so as to best develop the settlement of the territory and to distribute the water as widely as possible for irrigations. This act was based upon the theory that the waters of the territory belonged to the public or rather to the State (Territory), the only sound basis to act upon.

In the control of the waters of the territory, a form of public property, the court aimed to serve the public interests. The act of 1880 on the contrary was based upon the theory that the waters of the State when appropriated became private property. In the act of 1852 the waters were placed directly under the control of the county courts to distribute in the interests of the public property, subject to an economic and beneficial usage. By the act of 1880 the probate judge was eliminated and the county selectmen were to take the place of the county court. They were, however, given power to adjudicate disputes as far as possible, with the litigants having the right to appeal to a court of competent jurisdiction. The selectmen, therefore, were merely acting as a court to settle disputes as to property rights which now belonged to the individual. For the act goes on to say in Section 8 in referring to water rights "and such rights may be appurtenant to the land upon which it is used or it may be personal property, at the option of the rightful owner of such right and a change in the place of use of water shall in no manner affect the validity of any person's right to use water, but no person shall change the place of use of water to the damage of his co-owners in such right without just compensation." Of course up to this time there has been petty trading, and buying and selling of water, but it was only an insignificant part of the whole and it was not based upon any legal right or established custom to do so. It was the rule for the water to pass with the land, and in the main it had been regarded as appurtenant. Here, however, was a general provision of law to make it personal property and to separate it from the land at the pleasure of the owner. At the option of the owner the water became personal property and subject to transfer by the mere delivery of a certificate of sale.

Under certain circumstances in a new country, it may be desirable for the State to permit the transfer of the right to use water from one piece of land to another by special permission of the state authorities having in control the water affairs. It should be allowed only after special investigation and under strict regulation. For a state to permit such wholesale trading and trafficking in water as this act contemplates is a mistake of the gravest magnitude. In order to protect the present and future welfare of agriculture the water should be appurtenant to the land. The State should watch carefully that under no circumstances should conditions be permitted to arise where the ownership of the land and the water would pass permanently into separate hands. Under such arrangements the proprietors of the soil would enter upon a state of servitude to the owners of the water. Where water is scarce and land plentiful this might easily come about. In European countries in order to avoid such a situation arising, special precautions are taken to have the water appurtenant to the land or else to have the state own the irrigating system with the farmers possessed of an economic and beneficial right of usage of the water. When this does not exist the right to carry water and sell it is very carefully supervised.

The question naturally arises, why this radical change in the law? It can be explained only by the fact that serious difficulties were arising between the citizens of Utah and the Federal Government. All the executive officers of the territory had long since been appointed from non-residents. Threats were made that Congress would take the franchise away and either appoint all the officials both local and general in the territory or leave them to the election of the non-Mormons, very few of whom were interested in agriculture. The most natural thing, therefore, was to repeal the authority exercised by the county courts, declare the water rights vested and leave them, if difficulties arose, to the courts.

Another provision of the act required that it take seven years of non-use of water before the right had been abandoned. This is certainly an abnormally long time in an arid land where water is so valuable.

The law of 1880, however, did have an excellent provision. It provided that the selectmen of the county were authorized to have all streams measured, the rights determined and certificates issued and recorded. If this provision had gone into effect the streams would have been properly divided and adjudicated by now. This act like the act of 1852 was questioned as granting judicial authority to an administrative body not included in the organic act and it was not therefore enforced and nothing was done and little has been done since.

CHAPTER V

COUNTY COURTS AND THE CONTROL OF IRRIGATION WATER

Soon after the settlement of the territory it was found by experience that some legal control must be exercised over the appropriation of the natural resources, and the territorial legislature in 1852 conferred the authority of such control upon the County Courts. Chapter 1, section 38 of the session laws of 1852 says: "The County Court has control over all timber, water privileges or any water course or creek; to grant mill sites, and exercise such power as shall best preserve the timber and subserve the interests of their settlements in the distribution of water for irrigation or other purposes."

The powers here delegated to the courts, which consisted of a probate judge and three selectmen, were exercised extensively, and, in the more densely populated counties, the control was continued until the law was repealed in 1880. Many reasons were brought forward for the repeal of the act of 1852. Leading lawyers held that the legislature lacked authority to grant such powers to the County Courts because the act of Congress establishing the territory and providing for its courts failed to include a grant of such powers to the county courts. At the same time it must be admitted that the administrative and judicial control exercised by these courts over water control was very efficient. The success undoubtedly was due to the fact that the work was almost entirely administrative in its nature and three fourths of the membership of this court was made up of practical men who understood the problems.

An effort will be made in the chapter to bring out through water cases actually dealt with some of the principles established by County Courts. Out of the thousands of cases dealt with, space limits the citations to a very few.

WATER-MASTERS

Several counties were organized at the first session of the territorial legislature. Among the first acts performed by the county court in assuming control of the waters of their respective counties was the appointment of water-masters. These agents were to carry out the orders of the courts and personally to see that the water was properly distributed. This was all the more necessary when we understand that appropriations of water, to a considerable extent, had been made during the preceding five years of settlement. In March 1852 the County Court of Davis County appointed fifteen men as water-masters or supervisors to have control over "the several creeks in Davis County for irrigation purposes." In the appointment, each water-master was given a definite stream to supervise. In April, Salt Lake County appointed twelve men as water-masters. Weber County in June made similar appointments for the county outside of Ogden City. In order to define their duties which were similar in all counties and to enable them to enforce the authority invested in them the court passed the following regulation: " Be it ordered by the County Court of Weber County that if any person or persons shall use water, taken from any stream in Weber County for public use in irrigation without the consent of the overseer (water-master) or committee of the same he shall be subject to a fine in any sum not less than three nor more than twenty-five dollars at the discretion of the court having jurisdiction therein."

Box Elder County Court appointed water-masters in 1856, Cache County in 1860, and other counties followed the same practice as they were organized. In most of the counties outside of the cities the county courts exercised full and complete jurisdiction over the waters until such authority was taken away from them by the law of 1880. The courts appointed the water-masters on their own initiative or upon recommendation. If a mistake had been made in the appointment of a man whose services were unsatisfactory and a petition was presented for his removal the policy was to grant it unless a good reason existed why it should not receive favorable consideration.

The plan of having the court act independently and without previous consultation with the irrigators, in appointing the water-masters did not appear to give general satisfaction, so Davis County Court began in 1876 a plan that became general. The county was divided into districts including the areas supplied with water from a given stream or spring and the users of water in each district were asked to meet in a mass meeting and name a man to be appointed for the district for the ensuing year. The court agreed to appoint the men so nominated by the several districts. It was of course specified that the water-masters so appointed whether directly by the court or upon the recommendation of the irrigators were to be under the control and supervision of the county court itself and not subject to those who recommended them.

It was ordinarily arranged that one of the selectmen as part of his subdivision of the work should have control of the water-masters. Box Elder County on July 6, 1874, worked out a logical system by the appointment of a head or supervising water-master whose duty it was to have general control of the water of the whole county and to instruct and to direct the water-masters of the several districts. In all counties the water-masters were appointed for a year but were really subject to dismissal by the court at any time for cause.

With the exception of the head water-master in Box Elder County, the water-masters were paid by the farmers. A levy of so much was placed upon each acre of land to be paid by the farmer ordinarily in the fall after harvest. In the early days of the settlement of the territory the payment was made in some form of produce, usually wheat. In making the levy each district was allowed to fix the amount per acre, according to its local needs, except that sufficient must be levied to pay the expenses, otherwise the county court would intervene and raise the levy. The same policy under supervision of the water-master was pursued in respect to cleaning out the canals and ditches.

GRANTS

In early territorial days in the small projects or canals, destined to irrigate small areas the bishop or a committee of the community divided the water. But in the more important projects, especially those of Salt Lake County, the high authorities of the Mormon Church took an active part in promotion, construction, and control, Brigham Young frequently assuming leadership in the larger and more difficult projects. In fact the Mormon Church often appropriated money out of the funds of the Church for the completion of irrigation canals so essential to the welfare and success of colonization schemes. These appropriations sometimes took the form of loans and at other times outright gifts. When the Federal Government established a territorial government the control of the waters of the territory were quickly taken over for administration by the Civil power. In fact the people of the territory had attempted to provide a civil government for themselves in the hopes that the National Government would recognize their effort in the so-called State of Deseret. A constitution was adopted. Utah was then a long way from Washington in miles and time and while Congress was considering the question of admission the legislature, which had been elected, enacted laws organizing counties and cities and providing for the control of the natural resources, particularly water, timber, and grazing. The proposed State was denied admission so the laws became null but they were re-enacted just as soon as the territorial legislature convened. Thus while they legally only date back to 1852 in fact they go back two or three years earlier. Likewise the grants of water power or natural resources made by the State of Deseret were reaffirmed by the territorial legislature. Grants by the legislatures have already been considered, therefore only grants made by the counties under the act of 1852 are considered in this chapter.

In the mining industry in the West, it had been the policy when a man asserted a right to a mineral claim to post a notice on the land claimed. The same method has been followed in many states from the beginning in respect to the appropriation of water. A notice was posted on the natural stream at the point where it was expected to divert the water into the proposed canal. Obviously such a notice is valueless, for who can be expected to see a notice of appropriation buried deep in willows and underbrush and placed at some distance from the public highway? In the early history of Utah, a like policy was inaugurated, but it was at once seen to be entirely unsuited for notice of a water appropriation. If another locator went on to a mining claim he could see the notice which had been previously posted there, but in the case of water a man contemplating appropriation may undertake to divert at another point on the stream and never be aware of the posted notice. Defects of this system were apparent even in the small compact communities of Utah. On July 31, 1852, the County Court of Salt Lake County passed the following resolution. "Be it ordered that in the future the notice to bring petition for privileges by the court be advertised in the Deseret *News* at least twice before the sitting of the court at which the said petitions are intended to be represented." The Deseret *News* was the only newspaper in the territory at that date. In other communities where there were no papers notices were posted in public places or announcements made in public assemblies. Even Church services were utilized for such purposes. These precautions were taken in order that water would not be appropriated without specific orders of the County Courts, for the courts claimed the right not only to grant but to reject any petition presented.

Before the establishment of the County Courts, large bodies of water had been appropriated. The fact, however, that the water had been appropriated prior to the establishment of jurisdiction of the courts over the streams did not prevent the county courts from assuming jurisdiction over the streams. If the use was a proper one and the amount used was economic it was left undisturbed but in case it did not represent beneficial and economic use the court would investigate and cause redistribution or a reduction.

The mountain streams flowing down steep canyons abounded in waterfalls and afforded excellent opportunities for power plants. The young commonwealth was in great need of saw mills and flouring mills and the necessary power to run the machinery was at hand from the mountain streams. Long before the waters reached the point where they were diverted for irrigation they could be utilized to develop this necessary power. The county courts assumed jurisdiction over these power sites and undertook to administer them in the interests of the public and also to prevent injury to agriculture. It would be useless to recite all the cases involving a grant of water power by the several counties. A few, however, will be given to illustrate the policy.

As early as 1852 A. P. Rockwell, G. W. Parrish and A. Gardner petitioned separately to the County Court of Salt Lake County for the right to build saw mills and shingle mills at different points of Mill Creek. The petitions were granted. In the same year similar privileges for a saw mill and flouring mill were granted by the Utah County Court on Provo River, and on the Spanish Fork River. The other counties pursued the same policy and men were not allowed to erect mills upon the natural streams or to obtain water from them for power without first obtaining a grant from the court of the county in which the stream was located. John Taylor was compelled to obtain permission to place a mill upon his own land where he intended to use a stream flowing through his own premises. In 1866 Charles Crisman petitioned for the use of water from Mill Creek to propel a flouring mill, the court granted it on the following conditions: "That the use and benefit of said waters of said creek is granted unto said Charles Crisman to propel said mill provided the said Crisman will in no case dam such stream more than two feet when he takes out the water into his race in a low stage of water and that he have fifteen feet space for the water to tumble over at high water and that said Crisman be responsible for all damages that he may do to any lands located upon said creek or to the state road." In a petition by A. Thorne to the county court of Davis County for the use of water for power purposes to operate a mill to grind sugar cane it was granted on the condition "That petitioner does not interfere with irrigation or the convenience of families where they use the water for household purposes." This policy was pursued by the counties until 1880 when the law took the authority away from the courts. The great advantage of such a system is that the men who desire to secure grants for the operation of mills or machinery of any sort can find out in advance by petition whether they can secure the necessary power and under what conditions, so that it is not necessary to expend large sums to excavate canals and erect mills only to have some one secure a restraining order just as the project is completed.

The grants for power sites of these early days were comparatively few, but the grants for irrigation purposes were large in number. Before making water grants, both the members of the county courts and the commissions appointed by the courts made very careful examination into each request if the least doubt existed. Restrictions were placed around the grants to protect the public interest. In general the good of the community was always held in mind rather than that of the individual. It is in the study of these restrictions that is often revealed the policies pursued.

September 20, 1852, Zera Pulsifer and several others petitioned for the privilege of installing a dam across the Jordan River for the purpose of taking out irrigation water. The petition was granted on the condition "that all persons interested have equal privileges and further provided that said dam shall not damage the surrounding inhabitants by causing the water to overflow the banks of said stream or interfere with individual rights previously attained."

In December of the same year Lewis Wright was granted the exclusive right of Bingham Canyon Creek west of Jordan Mills for irrigation purposes. In the case of the people of the North Canyon, Davis County, for the use of the waters of Stone Creek, the court made the grant of the stream for the benefit of all the residents of the village provided that the bishop of the village shall have control and distribute the water for the community.

A. Perry and others June 2, 1856, petitioned the County Court of Box Elder for part of the water of Box Elder Creek for irrigation purposes for the benefit of the settlers of Three Mile Creek. The court granted the petition on the following terms: "The said Perry and others are to enlarge the water ditch sufficient to carry the amount of water required from Box Elder Canyon to their farms at their own expense and have what surplus water can be spared consistently for irrigation for the term of one year."

In Davis County in 1856 on petition of the settlers of North Mill Creek for a grant of half of the waters of Mill Creek the county court appointed a committee to investigate the amount of land irrigated by the stream and instructed the committee to divide the waters of said creek according to the number of acres of land to be irrigated from said creek on each side. The decision of the committee was to be subject to the confirmation of the court. Here we have the court looking forward intentionally to the time when all the land would be brought under cultivation and to the community welfare rather than permitting a few users to appropriate all the water they desired. Not only did these courts retain the right to require a wide distribution of the water, they also maintained the right to say where the water should be used and when the canals should be completed as seen in the following case. A. Gardner and others were granted two fifths of the waters of the Jordan River to be taken to the point of the mountain for irrigation purposes. The Canals to be completed by

January 11, 1863. The grant to be subject to change by this court for the benefit of the community.

When the facts were not clear to the court, it frequently availed itself of the services of others. In April, 1861, the inhabitants of Freedom, Davis County, petitioned the court for portions of the waters of Haight Creek. The court not having the necessary information before it to make a decision appointed a committee to ascertain the facts bearing upon the petition and to report to the court at an early date so that a decision could be reached upon the petition presented. S. D. Cahoon and twenty-nine others petitioned the county court of Salt Lake County, May 13, 1867, for the waters of Little Cottonwood Creek below Thomas A. Wheeler's farm. Inasmuch as this canal would be below all other ditches and could not therefore interfere with the rights of others or appropriated and used waters the court granted the petition. J. N. Barker, of Box Elder County in 1869 petitioned for the use of a small stream northeast of his farm. The petition was granted "on condition that the water-master shall direct the course in which said water shall be conducted and that it also supply two families for culinary purposes."

It was a common practice to require that when grants were made, the canals or ditches should be constructed under the supervision of the water-master. The benefit of this plan being that they might be made to serve other uses in later years without cutting up additional fields for new canals.

The court also exercised the right to grant limited usage. In the petition of John Parker and others "the court decided that the water should be granted to the land for which it was asked up to the first day of July." This is really a grant of surplus water or of early water, when the supply was abundant.

The county court even exercised control over appropriation by the cities. In 1875 Odgen City, through its mayor, petitioned for a right for the city to appropriate for city purposes a volume of water ten feet wide, three feet deep and flowing at a certain velocity. After a careful investigation as to the needs of the city for water the court granted the petition. Three hundred and ninety-three petitioners requested the court to grant them the privilege to appropriate one fourth of the waters of the Jordan River. The petition was granted on the condition that the petitioners organize themselves into a corporation for the purpose of control. They were permitted to divert the water above the existing dam. The county had paid for the construction of the dam in the Jordan and could therefore consistently grant permission for its use to new applicants. On March 3, 1879, twelve residents of Salt Lake County applied to the county court for the water flowing from Coon's Canyon. The waters of Coon's Canyon had been previously granted by the court in 1875 to Peter Reed and others, but they had done nothing to appropriate the supply or put it to beneficial use. The court said: "It also appearing that said parties to whom this had been previously granted are residing below or north and east of the Utah and Salt Lake Canal and will necessarily depend upon said canal for water for irrigation purposes, it is therefore ordered by the court that the said petition be and is hereby granted."

The dam in the Jordan River had been built in the spring of 1873 near the southern limit of Salt Lake County for the purpose of controlling the waters of the Jordan and distributing them for irrigation purposes. Two days before the law of 1880 went into effect the county court of Salt Lake County made to these canals grants of water. It has been charged that the court in doing this acted in bad faith. The truth is that if the court had failed to exercise its power it would have been recreant to its duty and false to its promises. For in order to have these canals constructed, it had promised the men who had invested large amounts of capital in the construction that such grants would be made. So on February 20, 1880, after reciting in the introduction to the resolution that such express understandings did exist the following decree was entered:

"It is now ordered that said West Jordan Irrigation Company shall have the rights to take water out of said dam to an amount not exceeding three-sixteenths of the waters of said Jordan River and convey the same through said Utah and Salt Lake Canal to the lands to be irrigated thereby" and "whereas an order of this court has hereto been made granting to the owners of the canal on the west side of said river the right to take water out of said dam not to exceed one-fourth of the waters of said dam is confirmed. The right of the canal of the South Jordan Irrigation Company was taken up. This company diverted the water about one and one-half miles below the Jordan Dam and it was decreed the right to one-third of the waters of the Jordan River. The Jordan and Salt Lake City Canal then being constructed was granted one-third of the waters of the Jordan River to be diverted at or near the same place where the South Jordan Canal is taken out of said river."

These are the final grants made by the Salt Lake County Court. For twenty-eight years it had controlled the waters of Salt Lake County. The court was open at all times for the consideration of new grants or the control of old ones. The process was inexpensive and compared with the present system, eminently satisfactory and efficient. The passage of the law of 1880 was a great step backward in water jurisprudence for the territory, a fact which has never been fully recognized. The county courts in water cases for twenty-eight years expeditiously administered substantial justice at the minimum cost. This is all that can be said of the most efficient tribunal.

DAMS AND CANALS

The county court took control of the location of dams and canals. If it were possible for a dam to be so placed as to serve more than one canal it was required that it should be so located. In the location of a canal the welfare of the community was held paramount, and men were not permitted to locate canals merely to suit their own convenience. The court itself or a committee appointed by it ordinarily located the dams and the canals. In any event no important dam or canal could be located without the approval of the court.

In 1852 Zera Pulsifer was granted the right to place a dam in the Jordan River to divert water for irrigation on condition that all persons interested in the dam should have equal rights. A petition was presented by N. Haws and others of Utah County that a dam be removed from the Peeteetneet Creek. The request was opposed by James Pace and others and after a full hearing the court ordered the dam removed as "expedient for the general good of the community and as a nuisance." Sidney Brooks presented a petition to the county court of Salt Lake County for the privilege of making a canal. The request was opposed but granted. In March 1854 a committee of the court of Weber County reported that they had located the Weber Canal. The court approved the report. In 1856 thirty farmers of Salt Lake County petitioned the court for permission to construct a dam on the Jordan River about five miles above the Jordan bridge, for the purpose of taking out water for irrigation. The privilege was granted, on condition that the petitioners assume responsibility for any damage done in consequence of the construction of the dam. In 1854 the citizens of Brigham desired to enlarge or extend the canal running north to Dickenson's Farm. Permission was granted by the Box Elder County Court. In 1857 the court granted Robert Knell the privilege of constructing a dam in the North Fork of Kays Creek, Davis County, on condition that he assume responsibility for any damages occasioned by the breaking of the dam. F. Little was granted the privileges of constructing a dam in the Jordan River, in 1858, but as its location was within the limits of Salt Lake City the petitioners were also required to secure the consent of the City Council as well as the consent of the County Court. On June 6, 1859, the water-master of Salt Lake City represented to the court that the flood waters had washed out the dam in Canyon Creek and that unless it was replaced at once the crops would suffer for want of irrigation. The court ordered Ira Eldridge to undertake the construction of a new dam and to levy a tax upon the users of water to pay for it. G. W. Hickman and others of South Weber, Davis County, petitioned the Court for the privilege of taking water for irrigation out of the Weber River. The court considered the matter very carefully and then appointed a committee to examine and locate the canal so that it would be for the benefit of the whole settlement and do the least injury to any person's property. The committee was also given power to appraise any damages done to property by reason of right of way or construction.

The Court in 1861 was petitioned by the owners of the farming lands known as the Tenth Ward Survey, Salt Lake County, for the privilege of making a canal across a portion of a Mr. Neff's Farm. It will be observed that this is a request for a right of way across private property in so far as there could be private property before the Federal Government had provided for the issuance of land titles in the territory. The court granted the request on condition that "the canal be made on a straight line from the point where the water is taken out of the river to the Bluff." John Weinel petitioned in 1865 for the right to appropriate the waters of Grove Creek. A committee was appointed by the court to examine the whole project and if feasible to locate the canal which was done. Weinel was then informed that his grant of the waters was conditioned upon his conveying it through a canal constructed along the line laid out by the committee and approved by the court.

The cases already presented are sufficient to indicate the policy. All the counties did not keep such strict supervision over the location and construction of dams and canals. Some paid no attention at all to their location; others gave the system some attention but discontinued it in the sixties but Salt Lake County, through the county court, exercised strict control until 1880 and in some cases until 1882. It was not, however, in the location of new claims and canals alone that the court exercised control. In Davis County, S. Cook and several others petitioned for the right to construct a water ditch. The permission was granted on condition that at some future time the people of Riverdale may use the canal to convey all the water they desire provided they enlarged it sufficiently.

In 1870 A. Gardner and four others petitioned the court to allow them to take water through the new ditch from Little Cottonwood. The request was opposed by forty-three owners of the canal. The court ordered that the sum of $200 be expended to enlarge the canal under the direction of the water-master and when that amount was spent and the ditch correspondingly enlarged that the petitioners were to be permitted to run water through the canal.

A principle followed by practically all the courts was that when a grant of water or the location of a dam or canal was made the water right could not be sold or transferred or the location of the dam or point of diversion of the canal could not be changed without the consent of the court. On September 30, 1870, thirty-one citizens of West Jordan Precinct petitioned the court for the privilege of extending the Jordan Mill Race fifty or sixty rods up the Jordan River to improve irrigation facilities. The request was granted. In 1873 thirty-four owners of the South Jordan Canal requested the court's permission to change the point of diversion of their canal. This was granted after an investigation.

SPRINGS

The county courts controlled the springs as well as the streams. Even when the springs were located upon his land the owner had to petition for the use of the water. Davis County Court in 1856 granted John Weinel exclusive control of the waters of Grove Spring. Utah County Court in 1858 granted the Hot Springs to M. Green and others for irrigation. Alvin Nichols of Box Elder County received permission from the courts to use the waters of the Hot Springs to irrigate grass lands. L. W. and I. G. Hardy petitioned the court of Salt Lake County for the use of a spring located above their farm lands, and the request was granted. James G. Flackrell asked for the use of a spring on his land and near his house. The matter was referred to a committee for investigation to report to the court. I. B. Kent of the same county petitioned the Davis County court in 1865 for a spring located east of his farm. The court granted the use of the waters of the spring provided that no other spring or water course is injured by the withdrawing of the water from the spring.

Here was a recognition of the fact by the County Court of Davis that the diversion of percolating waters may injure a spring or a stream. It took the Utah Supreme Court about thirty-five years to come to this conclusion.

George D. Grant was authorized to clean out and develop a certain spring near his farm. In 1875 L. D. Young petitioned the court of Salt Lake County for the use of the waters of certain springs arising on his land. The court ordered "that the right prayed for be and the same is granted to said petitioner and that he be required to take care of same when not in use." L. H. Kennard in 1878 had diverted and used certain springs on Antelope Creek and asked the court to approve the diversion and use of the waters for irrigation purposes, which was done.

SURPLUS OR WASTE WATER

Where there was a surplus of waste water, the court encouraged the use of it, but at the same time made it subject to grant by the court just the same as other waters. Near Salt Lake City a large number of five-acre fields had been created when the city was first settled. Water was brought to these at once and farm products produced very early to support the settlers. On June 25, 1852, J. L. Packer and fifty others petitioned the court for the privilege of using the surplus water of the canal built to water the five acre lots. The petition was granted by the court "when the water was not wanted for irrigation."

In 1856, the Salt Lake County Court issued the following order: "It is ordered by the court that William Andrews and Daniel Cahoon have the privilege of taking out the waste water of Little Cottonwood at or near the State Road and have the control of the same for irrigating purposes." In the same year "it was ordered by the court that the citizens of Union have the right to the use of all the waste waters of Dry Creek not required for the farms of A. S. Merrill and John Neff for irrigating purposes." Weber County Court in 1871 granted the request of twelve farmers to use the surplus water of Three Mile Creek. In Davis County in 1873 George D. Noble asked for the use of the waste water arising from the Lower Springs after they had supplied the needs of the farmers having a prior right. The right was granted to use the water after it had left the land of Anson Call and others.

APPLICATIONS DENIED OR RESCINDED

In water jurisdictions, the power to approve grants has not always carried with it the authority to deny them. But in the County Courts of Utah the authority to deny applications was frequently made use of. It will not be possible to consider each denial, and a few cases will be chosen to illustrate how the authority was used.

In 1855, twenty-four farmers petitioned for the privilege of bringing out the water of Bingham Canyon. The petition was protested by eleven farmers and the court said after a careful investigation that it had decided not to grant the petition because there was not enough water for all. The petition of I. C. Little and others of Davis County in 1861 for the use of the water of Canyon Creek for irrigation purposes was considered together with a remonstrance based on the ground that to make the grant requested would injure the land already under cultivation. The court appointed a committee to consider the grant on its merits and to investigate the supply of water. After investigating the different claims for a month the committee reported against making the grant and the petition was denied. In 1867 the county court of Davis County rescinded a water grant to Bair because he had not complied with the terms.

Several citizens of Big Cottonwood appeared before the County Court on March 21, 1872, and made representations showing that the right to use the waters of Dry Creek and Spring Creek granted to Niels Peterson and others January 20, 1872, interfered with the rights previously granted in that there was not enough water for all. The court ordered the grant to Niels Peterson and others revoked. The court of Box Elder County in 1872 had granted certain springs upon lands formerly owned by Captain Evans and others. On the report of Jesse W. Fox, in 1873, that he had surveyed the lands in question in 1853 for Captain Evans and that the springs were included with the land, the court revoked its former order and awarded the springs to H. P. Jensen the present legal owner of the land. The request of L. P. Johnson for the use of the waters of Dunn's Creek was summarily denied by the county court of Box Elder County because all the water had been appropriated. In 1873 the county court of Davis County granted the citizens of the South Water District an emergency grant to save their crops until more satisfactory arrangements could be made. In 1875 they came back with a similar request and the court denied it. The Salt Lake County Court in 1876 in response to a request by O. A. Goetla for water to be used near Sandy said: "The Court decided not to grant any more individual rights for irrigating purposes until said ditch is enlarged as all the water that can be brought down to the farming land is now used for irrigating purposes and to supply the inhabitants of Sandy and the smelters there."

FINANCIAL AID IN THE CONSTRUCTION OF DAMS AND CANALS AND DAMAGES PAID

In the construction of canals and dams it is often assumed and even asserted that the cooperative system provided Utah with its system of irrigation canals, but a careful investigation reveals the facts that cities, counties and territorial treasuries were drawn upon for support in the building of dams and canals. In some instances taxes were specifically levied to aid in the construction of canals that were essential to the economic prosperity of the several communities. It is an open and notorious fact that the Mormon Church out of its revenues has financed a large number of irrigation projects and waited until the settlers could return the funds advanced. The records of Salt Lake County are such as to make it almost impossible to determine how much was spent to aid in the construction of its irrigation system. The records do show, however, how much was spent on the dam in the Jordan River, a sum amounting to $12,000 and the dam was given outright to the different irrigation companies using it.

In Sept. 30, 1870, A. Gardner and four others petitioned for the right to use the New Ditch to carry water to their farms. Upon investigation the ditch was found too small and the county appropriated $200 to enlarge it when the petition was granted. In 1872 the County Court contracted for the construction of a dam in the Jordan for the sum of $4700 to be paid out of the county treasury. The dam was to be completed by June 1, 1873. In 1873 seventy-six farmers petitioned the county for aid in the completion of the West Jordan Canal. The court deferred action until it could examine the country through which the canal runs. The payment by the court of $103.25 for repairs and special water-master services and $960.83 in 1873 for excavation shows the attitude of the court.

The county of Salt Lake also paid for the salary of the care-taker of the dam at $40 (forty dollars) a month for the year. These are only minor amounts, but they show the use of taxation to build canals. Just when the appropriations were made to the South Jordan Canal Company and to the Utah and Salt Lake Canal Company it is difficult to determine, but in a settlement that the county insisted upon in 1883 it developed that the county court had expended from the funds of the county treasury $22,622.63 in the construction of the South Jordan Canal and $33,949.94 on the construction of the Utah and Salt Lake Canal. In the first request for a settlement made by the court upon the directors of the South Jordan Canal Company in 1883, three years after the court had lost jurisdiction over the irrigation waters of the county, the directors of the South Jordan Company decided to ignore the request because they contended that the water company did not owe the county anything. Finally in 1884 upon the court strongly insisting that by the act of 1880 the canals became private property and that the money advanced by the county was an obligation by the canal companies to the county. A settlement of $5000, disregarding interest, was made upon the $22,622.63. In addition to this it was agreed that the county should hold a small number of shares of stock. A like settlement was made for the $33,949.94 spent upon Utah and Salt Lake Canal.

The amounts given above do not include the cost of engineering services which were rendered free to the companies and at the expense of the county. In addition to the foregoing accounts in 1882 the county court gave to the Utah and Salt Lake Canal Company, the South Jordan Canal Company, Utah and Salt Lake City Canal, East Jordan Canal Company, and the North Jordan Canal Company each, one-sixth interest in the dam in the Jordan River together with the right of way that each canal occupied which rested in the county. The dam alone cost $12,000.

In Weber County in 1852 the county loaned to the city for the construction of the Weber Canal two-thirds (⅔) of the county revenue for that year. In 1853 the Weber Canal Company came back to the county through Ogden City for another grant. The county court offered to advance the money as a loan or to accept stock in the canal as payment but this offer was refused. Finally, no other funds being available, and the Court refusing to consider any other terms, the funds were advanced and stock in the canal given in payment. In this agreement the county court agreed to appropriate funds to complete the canal on condition that the control of the canal rest in the hands of the city council and the county court and that farmers using the waters of the canal for irrigation pay an annual fee per acre for its upkeep. Persons delinquent in their taxes in 1852 were permitted to work them out on the canal.

Prior to 1854 the Weber Canal was only partially completed and the City Council and the county court determined upon its completion. The county court appointed a committee to locate it and March 18, 1854, the committee reported that it had located the canal. The committee was then instructed to receive bids for its construction and let the contract to the lowest bidder on condition that the work must be done by July 1, 1854. September 7, 1854, the city council and county court passed a joint resolution "providing that all county and city revenue for 1854 be paid out on said canal except contingent expenses." Up to May 16, 1855, the city and county had advanced $2,970.42 toward the construction of the Weber Canal.

The counties outside of Salt Lake and Weber did very little, if anything, from the public revenues toward the construction of canals or dams. The county court of Box Elder on December 4, 1876, appropriated upon a verbal petition of several farmers $1,000 to assist in defraying the expense of making a canal in Box Elder Valley "for general irrigation purposes."

Occasionally the counties paid the damage sustained by farmers through breaks in dams or canals or from flooding. But generally it was embodied in the grants, when made, that they should pay for damages suffered through the irrigation system. January 19, 1872, a farmer of Salt Lake County appeared before the court and showed that he had suffered damages to his property occasioned by the excavation of a ditch made to turn the waters into the Big Cottonwood Canal. The court settled with him for $296.50. In a similar case in 1872, $66 was paid to L. Bringhurst for damage to a five acre lot. The few cases where damages were paid go to show that the county did assume the full responsibility of the waters within its boundaries.

TRANSFER OF WATER RIGHTS

June 7, 1875, Silas Richards petitioned the court for the right to transfer his water right. The court ordered "That the said Silas Richards shall have the privilege and right to take his portion of water in the ditch known as the Surplus Ditch to his farm south of Union Fort as he does not want to use the same on the land where he formerly used it."

David Brinton and two others had purchased the waters of Little Willow Creek from the former users but the county court did not concede the right for an irrigator to transfer his water right to another person or to another piece of land without its consent. Undoubtedly many such transfers took place. In fact, it is known they did, yet there are sufficient instances on record to show the attitude of the courts when the question came before them. In Davis County, December 23, 1861, John Gailey petitioned the court to permit him to use the water belonging to a poor piece of land on a good piece of land, owned by him, which was not entitled to water. The court granted the petition. In granting to A. Gardner and others the use of a canal, when enlarged sufficiently to carry water, the court in Salt Lake County in 1871 said "These men (giving the names) shall have the right to take their portion of the water out of said ditch where it will be to their greatest interest whether it be east or west of the State Road." On March 23, 1875, several farmers of Sandy and Salt

Lake County petitioned the court "to grant them the right to take and use their right of water which they have secured in the New Ditch leading from the narrows of Little Cottonwood west by Sandy on the east of the State Road"; the court ordered that the petitioners "have the right to use their portion of appropriations." Many writers maintain that the best system of water usage is where the water right is attached to the land so that it is impossible for any one to gain a monopoly of the water supply. If, however, under any circumstances transfers are to be allowed whether from individual to individual or from one piece of land to another they should require the approval of a competent court or other tribunal legally having charge of water right transfers.

THE ADJUSTMENT OF WATER RIGHTS

The two most important functions invested in the county courts were the granting and the adjudicating of water rights. Most of the water of the territory had been appropriated before these courts had been established, and where the appropriators made a beneficial and economic use of the water the old rights were recognized, but where the use was not a beneficial or economic one the county courts did not hesitate to reduce the amount. The common way of dividing the waters of a stream was in fractional parts of the flow rather than in second feet. The methods of settling the difficulties can be best illustrated by a consideration of a few of the cases brought under the jurisdiction of the courts. It must be borne in mind that the primary consideration by these courts in making water grants and in adjudicating water claims was the welfare of the community rather than the interest of the individual unless these interests were coincident.

In 1855 the county court of Davis ordered "that the bishops of the several wards of Davis County shall have the right and power to control the water powers of the canyons and etc., so far as it shall be deemed for the general welfare of the public."

In the year 1856, several complaints reached the court of Salt Lake County in regard to difficulties arising over the distribution of water; the selectmen of the court were appointed a permanent standing committee to make adjustments as far as possible.

There was trouble over the distribution of the waters of Little Cottonwood Creek between the different canals and the towns so the court created a special committee of the selectmen to investigate the whole matter to determine upon a plan of distribution, to consider what lands were entitled to water and to recommend the omission of lands from irrigation if it was desirable. The committee was appointed September 2, 1856, and at once went to work. At the next regular session of the court it was prepared to report that in its judgment it would not be good policy to exempt any of said lands from the use of waters but rather to divide the water among the farming lands as follows: "The land east of the County Road known as Little Cottonwood one-ninth, Cahoon, Ericksen, and Maxwell ditch, five-eighteenths; the lands on the north side of Little Cottonwood, two-ninths; land belonging to Union Ward and next to the County Road, five-eighteenths, and lands watered by the Hammond Ditch one-ninth of the flow of the Little Cottonwood stream."

The report was approved by the court and accepted by the water users.

In September, 1859, a petition was presented by Andrew Cahoon and other inhabitants of South Cottonwood representing to the court that their water privileges were being infringed upon by the inhabitants of Union Fort settlement. The matter was referred to the selectmen for an adjustment.

A. S. Merrill sold in 1862 a portion of the flow of Dry Creek to the inhabitants of South Willow Creek. The court ordered the transfer approved and upon the request of all parties interested divided the waters of Dry Creek one-half of the flow to John Neff and one-half to the inhabitants of South Willow Creek until the first day of August in each year, and thereafter the inhabitants of South Willow Creek were to have control of two-thirds of the stream and John Neff of the other third, the water to be divided at the most suitable place at the base of the mountain.

In Davis County the farmers in 1857 petitioned the court for an investigation of the rights of the users of the South Sandy Fork Creek. The court appointed a committee to investigate the rights of the farmers on the stream and to report to the court what they regarded as an equitable distribution of the waters. The report was to be made as early as possible so as to go into effect that season. In this case the committee was appointed from citizens outside of the court. The court followed a similar procedure in 1860 in regard to the waters of Stoker's Ward with like satisfactory results.

An interesting case arose in Box Elder County in 1859. Harmony Pierson had purchased a spring for his exclusive use. Other users of the waters flowing from the spring protested Pierson's exclusive use. The decision of the court is set out here in full. "The court was called upon to establish the right of water for irrigating purposes, to Harmony Pierson's spring in District 1 by Water-master James Whitaker. The court held that Pierson had not the exclusive right to said spring water, although he might have bought it with that understanding but it belonged to the public for irrigating purposes as much as any other water in the district and should be controlled by the water-master for the citizens who are interested and who expect to get water from said spring, paying an equal proportion of the first cost with Pierson for said spring water privilege and thereafter to hold an equal right with him to said water for irrigating purposes in respect to the respective quantity and quality of land to be irrigated by said spring."

This decision is a particularly valuable one, setting forth as it does the all-important doctrine that the waters of the territory belonged to the public and not to the users and that the distribution should be according to economic needs. Although the language is not very clear, it is doubtful whether any decision pertaining to irrigation and involving irrigation law has ever been based on sounder principles.

In 1864 differences arose between Union and South Cottonwood as to the division of Little Cottonwood; the court appointed water-masters to divide the water according to its former decree. Finally for each canal drawing water from Little Cottonwood a water-master was appointed and all of them formed a committee to see that the waters of Little Cottonwood were properly divided. The citizens of North Canyon, Davis County, in 1864 petitioned the court for a committee to investigate the proper course and use of Barton Creek. They represented that the creek had been diverted from its proper course and use. The committee was appointed but the report is not recorded. The same court in 1867 ordered an investigation of a complaint by John Weinel that certain parties were interfering with his water claims.

These courts, even without complaint, exercised the right to investigate the misuse or abuse of the use of waters if they saw fit because the waters were held to be public property as expressed in Pierson's case. The citizens of Spanish Fork, Utah County, in 1865 remonstrated to the county court against certain grants that it had made claiming that by such action they were deprived of sufficient water to produce their crops. The court appointed a committee to look into the kind of land, its lay and the amount of water it required for an economical use. So that it could make a final and equitable decision, which it attempted to do upon the facts furnished by the committee. The county court of Salt Lake County was petitioned in 1867 by the farmers east of the Jordan Mills, in the bench, for the surplus waters of Little Cottonwood. The court made the following decree: "That the surplus water of Little Cottonwood asked for in said petition be divided between the ditches below said stream so that there shall be an equal distribution according to the amount of land to be irrigated. The county court to make said division if any controversy should arise which could not be settled by the water-masters of the several ditches."

A dispute arose between D. S. Stone and I. N. Spaulding of Weber County as to who was the rightful claimant of Stone Spring. The court appointed a committee to investigate the matter. The committee reported that D. S. Stone was the rightful claimant of the waters of Stone Spring and also East Spring near by for irrigating purposes and, acting upon the report of the committee, the court awarded him the spring. Disputes arose as to the rightful claimants of Canfield Creek; the Court of Weber County, early in the year 1874, appointed a committee to make a thorough investigation and report an equitable distribution. It was determined that the streams would water 116 acres and that it should be divided among sixteen claimants, in quantities of water varying from enough to irrigate one-half an acre to twenty acres. In making the awards the committee granted meadow lands the same quantities as farming lands, but in case an equal amount was desired the water from the meadow lands must be used early so that the best available use could be made of the water for the production of other crops. This was done because the hay crop is usually harvested early.

It was also recommended that "the water shall not be transferred from the lands having title to it under this apportionment to other lands where such transfer works an injury to any of those parties to whom the water has been awarded." In the complaint when first brought before the court objections had been raised to W. R. R. Stowell and George Poulter using the waters of Canfield Creek on the grounds that their lands were taken up from two to three years later than the lands of other claimants and consequently they did not possess prior rights. The committee ruled out this contention on the grounds "that the parties had paid taxes for the use of the water to the city council of Ogden in common with other claimants whose taxes had been appropriated by the City Council in the construction and enlargement of the Weber Canal and that in consequence of this the title of parties owning lands under the Weber Canal to the waters of the stream had been extinguished and their rights and claims transferred to those parties having lands east of said Weber Canal who had paid taxes to assist in furnishing them water from the Weber River. Moreover, the waters of Canfield Creek had been used upon these lands for twenty-eight years, and while repeated assertions had been made that Stowell and Poulter were not entitled to the use of water, but that during this long period no steps had been taken to contest their rights. In the meantime large sums had been expended for permanent improvements on the farms, especially by Stowell. Until at the present time, he has valuable corrals, orchards, fences, etc., on his farm. To deprive these farmers of water at this late date would be to destroy the labor of twenty-eight years." The committee therefore included in the awards the use of water to Stowell and Poulter. The court approved the awards of the committee. The same court in 1879 appointed a standing committee "to see that the waters flowing within the limits of Weber County are properly distributed to the parties entitled thereto according to their respective rights."

The distribution of the waters of Little Muddy River was taken up by the court of Cache County, July 8, 1878, and the following decree made. "Paradise, one-third of the South Fork to be divided at or near Jackson and Company Saw Mill and one-half of the East Fork to be divided at or near the head of the new ditch, also when Paradise people bring one-third of the South Fork into Hyrum Ditch then they are to take as much water from the East Fork in addition to the one-half as they bring in, Hyrum one-half of the East Fork and Wellsville two-thirds of the South Fork, said apportionment made agreeable to a division made by the inhabitants of Wellsville, Hyrum, and Paradise."

In a dispute between the users of water of Three Mile Creek, Box Elder County, the court decided that between July 15, and September 30 that the waters of Three Mile Creek be divided equally between districts three and four and after September 30, when the stream became very small, district three, where the village was located, should have two-thirds of the flow of the stream.

C. J. Lambert and Charles Wilkes petitioned the county court of Salt Lake in 1876 for a division of the waters of Canyon Creek near the Wasatch Woollen Mills. The court appointed Selectman E. M. Weiler to examine the claims and water admission of the same and report to the court for approval. The same matter coming up in 1878 the court appointed an official divider of waters to see that each person secure his just and rightful claims. The matter was not again brought into court. Disputes arising between the users of the waters flowing through the Bennion and the Parker ditches the court of Salt Lake County appointed a committee in 1879 " to divide and apportion the waters of these ditches."

If the reader has followed the citation of these representative cases, to which hundreds more might easily be added, he will doubtless be struck with the simplicity and directness of the methods of settling water disputes that obtained for nearly thirty years in the territory of Utah. The method was inexpensive and prompt. Seldom did a case remain six months before it was brought before the court for final settlement. It did not bankrupt farmers nor require the services of highly paid lawyers to get their water difficulties passed upon by a competent court. The principles applied were those of community welfare. At the same time individual rights were properly guarded. It was not possible for individuals or communities to appropriate water not needed in the hope that at some future date such waters may be useful, thereby retarding the development of other individuals and communities. Under this system of control and regulation very few of the disputes found their way into the district or the Supreme Court, although the law distinctly provided for the right of appeal.

Judging these courts by what they did, it was distinctly a retrograde step when this power was taken away from them by the Act of 1880.

CHAPTER VI

CITY CONTROL OF WATER

Some matters could be left for adjustment until a civil government was duly established, but the control of irrigating water, a most fruitful source of neighborhood ill-feeling and quarrels, could not wait for civil control, because crops must be grown and they would not thrive in this arid region without irrigation. Community irrigation, the very essence of the Mormon plan, had an institutional as well as a physical foundation.

DISTRIBUTION OF WATER

In the Mormon system the bishop is the local or community head or leader. He was supposed in the early days to look out for the economic and the spiritual welfare of his charge. No one thing contributed more to the material welfare of his communuity than an orderly and economic use of the irrigation water. So in the very beginning the control and the distribution of the irrigation water came under his jurisdiction. As has been pointed out, the canals were community affairs. In most cases, very poor accounts were kept of the contribution made or work done by each farmer. The fundamental idea was the economic need of water by the farmer to produce crops to support his family. This was the principle followed in the distribution of water by the bishop rather than the proportionate interest that the farmer may have acquired in the canal, for what did it avail the small community if it denied a farmer water, if it was available, and then had to provide for his family until the next harvest?

New settlers were taken into the system and provided with water before they had done a thing upon the irrigation system, with the mere understanding that if a shortage of water occurred they would enlarge the canal so it would carry more. The bishop or a community committee of which he was usually a member, was the controlling authority in the distribution of water, in the upkeep and enlargement of the canals and in the construction of new canals until such time as the civil authority was ready and willing to take over the management and control of the system in different cities and counties. In Salt Lake this came about in 1851, four years after the settlement of the city. Other cities and towns followed shortly afterwards but many of them continued under the old system for two or three decades. Even in so short a time as four years the authority of the bishops over the water had been so firmly established that when the city council was considering taking it over, according to its charter, objections were raised and in the discussion Alderman Felt expressed himself as "doubtful as to the jurisdiction of the board (City Council), over the waters of the city as an infringement upon the legislative powers of the bishops who had the prior right of control, before the city organization." The City Council held that the bishops had surrendered their rights and that it now rested upon the council.

For the first twenty years after the settlement of the territory practically all the towns were given control when their charters were granted of irrigation waters within their limits. And as the city limits in most cases included the adjacent farm lands that meant all waters used by the inhabitants of the communities for garden and crop production. So nearly universal were these grants of authority that there were only four or five exceptions. As there were only a few towns and cities that exercised this authority to an extent worthy of consideration, only the most important will be considered. These cities in the order of their incorporation are Salt Lake City, Provo, Ogden, American Fork, Logan and others. The provisions granting the authority were as follows: The Salt Lake City charter Sec. 55 in defining the powers of the city council reads: "To establish, make and regulate public pumps, wells, cisterns, hydrants and reservoirs: to distribute control and so regulate the waters flowing into the city throughout such channels as may be most advantageous and to prevent the unnecessary waste of water." The provisions in the Provo and Ogden charters defining the powers of the councils were as follows: "And for furnishing the city with water for irrigating and other purposes and to regulate and control the same; and furthermore, so far as may be necessary to control the water courses leading thereto in the immediate vicinity thereof."

The charter of American Fork granted the city council authority "to provide the city with water; to control the water courses and mill sites in said city, and the water courses leading thereto in the immediate vicinity thereof."

In section 17 of the charter of Logan City it provides for the control of schools and the levying of taxes for the support of the same and continuing it says "and for furnishing the city for water for irrigating and other purposes and to regulate and control the same; and furthermore so far as may be necessary to control the water courses leading thereto."

It can be readily seen that these provisions granted extensive powers to the cities over irrigating waters and also over the streams flowing in their natural channels through the cities. The American Fork charter expressly granted power over mill sites. This provision was not inserted in the other charters but it was exercised under the general grants. The Logan grant of power was the only one to embody authority to levy taxes to provide irrigation water. Other cities assumed the authority and did levy assessments against the land irrigated for the construction, maintenance and upkeep of their canals. The provision in the Logan charter was interpreted to mean authority to assess all the property in the city for the maintenance and support of the canal systems. As we shall see later, taxes were levied for over twenty years for the upkeep of the canals flowing through Logan City.

The authority of the several cities was exercised through ordinances passed by the councils, and also council actions involving questions needing special attention at the time and not covered by a general ordinance.

The season when water could be used for irrigation, under ordinary circumstances, was from April 1st to November 1st; and these dates were generally fixed by the cities. As a general rule, water was not needed so early or late for cereals but it was frequently used upon the meadow and pasture lands.

From the authority granted to the cities, they not only controlled the water within their limits to the fullest extent but in some cases where the streams did not flow within the city limits the city authorities exercised control over them so that they could be used only after permission had been sought and obtained in the form of a grant from the council. As illustrations of the authority exercised in making grants only a few cases can be cited. In general the grants made by the cities were for power purposes. In most cases they were for saw mills, flouring mills, etc., to be located upon the natural streams or the canals flowing through the limits of the cities. These, however, were not the only grants made. In Ogden, in 1851, the stream flowing out of Cold Water Canyon and not entering the city proper was granted to a man by the name of Montgomery. Similar grants were made to different individuals at the same session of the council. In 1855 William Van Noy petitioned Salt Lake City Council for the use of water to turn a wheel. He maintained that he had an agreement with the bishop that he should be granted such use. The petition was denied because there were prior petitioners. Lying to the north of Salt Lake City were several warm springs. They are mineral in their nature and from the earliest settlement of the territory various ambitious plans have been proposed to make that section a great health resort. The springs at an earlier date had been granted to Nelson Whipple but for one reason or another he had surrendered his right and the council in 1855 granted them to O. H. Raleigh. The council had had occasion to regrant these privileges several times.

City Creek was the first stream diverted by the Utah pioneers. Obviously in 1860 there was surplus water for, on petition, the council granted the use of the surplus to Joseph Corbett.

Logan City made several grants of water for power purposes, principally for flour mills and saw mills and sundry other small shops. In 1873 a committee was appointed to consider the rights of the several power companies using water, from Logan River. The committee made a report the same year which was adopted by the city council. The resolution really carried a grant of water power to the following users:

Firm	Business	Cubic Ft. Per Minute
T. E. Ricks	Grist Mill	1022
Hyde & Preston	Carding Mill	225
Mickelsen & Peterson		542
Charles Olsen	Turning Shop	208
Peter Affleck	Foundry & Machine Shop	638
Robert Croft	Foundry & Machine Shop	1099
Robert Croft	Foundry & Machine Shop	2308
Card & Son	Saw Mill	1200 1204
P. U. Peterson	Planing Mill	1099

Ogden River rises several miles east of Ogden City in the Wasatch Range and flows through the city. In 1870 the Ogden Northwest Irrigating Company desired to divert part of this stream from its natural channel. But so complete was the control of the city council over the streams that the canal company could not divert the water even though the point of diversion was not within the city limits without permission of the council. Accordingly the city council by resolution authorized the company to divert one-fourth of the Ogden River.

In the case of a desire to enlarge canals already constructed and conveying water beyond the boundaries of the city and for the purpose of increasing the supply for lands beyond the jurisdiction of the city, the city council held that the canal could not be increased with its consent. In 1878 Alma Harris and twenty-one others, all residents of Benson, petitioned the Logan City Council for permission to enlarge a canal in the lower part of the city at their own cost. The purpose of the contemplated enlargement was to supply water for Lower Benson. A few years later when Upper Benson made a similar request it was denied for several years until under pressure of a threatened suit at law the petition was granted by the council and the enlargement made by the petitioners.

In pursuance of a policy followed from the earliest settlement of Provo, the city council, in 1884 after a long and thorough investigation and examination made the following division of the waters of Provo River:

Provo Bench Canal	1/8 of the stream.
Hooper Ditch	1/15 of the stream.
Enterprize Canal	1/15 of the stream.
Lake Bottom Canal	1/15 of the stream.
Timpanogos Irrigation Co.	1/15 of the stream.
Upper East Union Canal	1/13 of the stream.
East Union Canal	1/10 of the stream.
Factory Race	3/20 of the stream.
City Race	2/25 of the stream.
Tanner Race	1/10 of the stream.
Little Dry Creek	1/20 of the stream.
River Bottom Canal	.0910 of the stream.

CONTROL OF CANALS AND WATERS

In the construction of the Weber Canal belonging to Ogden City, the work was done by contract. Part of the funds were supplied by the city and county and the remainder worked out by farmers who wanted water for their farms. The other canals in the vicinity whether to supply water to the farms or to the city lots were dug by the irrigators upon the cooperative plan.

Several of the cities as soon as they were incorporated, asserted and exercised control over the irrigation canals. In most instances this was done before an ordinance was passed. The council itself simply appointed a watermaster who took charge before passing an ordinance creating the office or defining its duties. Provo in 1853 passed an ordinance asserting authority over streams, canals and ditches flowing into or through the city and placing the same under the city watermaster. In 1866 the first imperfect ordinance of Provo City was superseded by another which provided that "all canals and ditches now used or that may hereafter be required for conveying water from Provo River into said city for irrigation or other purposes are hereby placed under the supervision of a city watermaster who shall be elected by the city council."

After the passage of the Irrigation District Act in 1865, owners of sections of the farm lands in Utah County desired to organize into an irrigation district but Provo City held strictly to its right to control the waters of Provo River and it would not allow farmers using waters from this source to organize except by a special agreement with the city. In order to control the situation, the city council passed in 1872 an ordinance governing the organization of such districts. Section 5 provided that "If an irrigation district is to be organized upon the wish of the farmers it is to be with the consent of the city council, and must render an annual report to the city council and be approved." Section VI of the same ordinance says: "When a majority of the water users of a ditch not running through the city proper organize an irrigation district it shall be under the supervision of the city and a written contract shall so specify."

Districts were organized and exercised their authority under and according to their charter from the territory. They have since been disorganized and the city has again assumed full control. To say the least this was a peculiar arrangement. The Irrigation District Law was a territorial act and it would naturally appear that if the farmers were eligible to organize a district that they would not be subject to limitations imposed upon them by the city. In practice, however, they submitted to the requirements imposed by the city ordinances.

At the present time, Provo City exercises full control over all the water flowing in the river at or near the mouth of Provo Canyon no matter whether it is used for power or irrigation purposes. The taxation of city lots and farm lands for the maintenance and upkeep of dams and canals and the distribution of the water all rests in its hands.

Mills and factories located in Provo City have not been allowed to acquire vested rights in the use of the water for power purposes. The city merely grants them a franchise terminable at the end of fifty or ninety-nine years. Several companies use water as power under the franchise privilege. The most notable of the users is the Provo Manufacturing Company. The provisions of the ordinances under which the privileges are as follows: "The Provo Manufacturing Company is hereby authorized under the water-master and in accordance with the ordinance regulating irrigation to obtain the necessary water from Provo River through the city race and other canals to run their machinery and the right of way is hereby granted the said Provo Manufacturing Company." Section 284 says that "the foregoing is regarded as a contract between Provo City, and the Provo Manufacturing Company to remain in force during the existence of the corporation." A few years ago this franchise expired and a similar one was granted by the city.

The most interesting features about the control by Provo City of the waters of Provo River are that in recent litigation over the water rights of the river that city set forth the claim that it possessed the legal right to control and distribute the waters of that stream and the courts have sustained its contention. So that the city's rights have now been established beyond controversy.

In Salt Lake City from the date of its organization in 1851 the corporation, for over thirty years, exercised through ordinances and special council action complete control of the irrigation canals and streams entering or passing through the city limits. In the early days a water supervisor was put in charge and matters needing the council action or approval were acted upon separately. In 1855, however, the city council prepared a body of legislation for the control of the irrigation system of the city. Part of the records of this legislation is lost, but sufficient remains together with the council action to show that the city regarded the water canals and ditches as part of the city property, set aside, as it were, for a special purpose like the city parks. In the part of the city legislation still in existence, the watermaster is given full control of the maintenance and management and upkeep of the irrigation canals of the city. The city council itself claimed the right to grant rights of way for the construction of canals and also the authority to grant or deny the diversion of water flowing in streams within its boundaries.

The Jordan River flows within the city boundaries. George A. Smith and others desired to place a dam in the stream to divert water to some farming lands. They petitioned the city council to that effect and the petition was granted on condition that the dam be erected in the river one-half mile above the Jordan Bridge. The petition recognized the city authority over the stream but the council went farther and specified where the dam should be located. Some months later when it was found undesirable to build the dam at that point the holders of the grant returned to the council for a change. In 1859 when the matter of making a ditch in the northern part of the city for the benefit of a farmer by the name of S. Girder came up the request was referred to the watermaster for a report before the council would act. In the same year the council approved a request to build canals from Taylor's Mill and from the Warm Springs. The ordinance in 1860 asserts the city's right to control irrigation and fixes a penalty for the punishment of any one interfering with water in the canals. The same authority was exercised by the ordinance of 1879 with increased penalties. Section XV says: "Public water ditches are defined to be first the natural and artificial channels through which water flows into Salt Lake City; second those constructed along the streets; and third those through lots and blocks for public use and over which the city exercises sole and exclusive jurisdiction and control."

In Ogden, the city began in 1852, 1853, 1854, by constructing the Weber Canal by taxation and consequently controlled it. Every other canal within the city was similarly controlled by the ordinances passed in 1857. Logan City from the date of its incorporation controlled the four canals running through its limits. Logan City could not fully control Logan River because the stream formed the southern boundary of the city. As late as 1892 in a specific agreement, the farmers, the mill owners and the city agreed that the city should control the irrigating canals.

The question naturally arises: how is it if these cities exercised such complete control over the canals and natural streams that all except Provo and American Fork have lost complete control? It will be observed that the only cities exercising control of irrigation water are those where the farmers have real or potential control of the city councils. In American Fork the farming population constitutes a very large percentage of the total population, so that the farmers really do control the irrigation system and the city council is only a means to that end. The same condition prevails to a marked degree in Provo although the farming population is not so dominant. It is doubtful if Provo could elect a council, a majority of whom were not farmers or whose interest and welfare were not parallel, if not identical, with the farming population of the city, for farming is the foundation industry of that section of the State. In both of these cases there is not the least danger of alienation of the irrigation water by sale. Nor does the growth of the cities cause any danger of the use of the irrigation water for city purposes.

For these reasons, the farmers have felt that their interests were safe under municipal control until recently when their respective rights have been reasonably well established by court decrees. With Logan the case was different. The river never was completely under city control because the city's southern boundary line was the center of the stream. This prevented the city from exercising exclusive jurisdiction over it. Four canals run north through the city. In addition to supplying water to the farm lands owned by residents of Logan they furnish water for Richmond, Smithfield, Hyde Park, and Benson. The residents of these towns never willingly consented to Logan City Council controlling their water supply. Especially as the council only aimed to control the canals until they reached the boundaries of the city where they abandoned them to the water users of the several communities. The Provo system was logical. It claimed the right to control the canals and streams flowing into and through the city to the lands and did so whether the lands to be irrigated lay within or without the city limits.

The fact that farm lands lay beyond the city limits did not matter. The city watermaster cared for the canals and distributed the water to the users. Logan City would not do that and dissatisfaction prevailed. As early as 1886 a committee of the council recommended that the city turn over the control of the canals to the farmers who use the water. The recommendations were not adopted and the city continued in control. But the great majority of the farmers desired to control their own irrigation water supply because of economy and efficiency of supply and also to have a united control from the source to the land. The city council was made up largely of farmers and they could see no advantage for the city to continue in charge, so in 1892 the city turned over the canals to the farmers who had built them and used the water.

Ogden and Salt Lake City began as agricultural communities and grew into commercial and manufacturing cities. As long as they remained primarily agricultural towns, there were no objections to the irrigation waters remaining under the control of the councils, but agriculture soon became of minor importance to these towns and the farmers became concerned as to the security of their water supply. In 1890 Ogden City sold her city water works to the Bothwell Canal Company and an agitation was started to sell the Weber Canal. Then it was that the irrigators began a movement that resulted in the city relinquishing control and in the organization of the Weber Canal Company which took over the management of the canal. The farmers became stockholders and held stock in proportion to the amount of water they had used. Salt Lake gradually gave up control to the farmers until now the city does not exercise any control over the irrigation streams or canals within its boundaries except such police power as is necessary for the protection of health and property.

As has been pointed out, the city councils themselves exercised control over the making of grants of water and also the rights of way for canals. It also reserved to itself final authority in the adjudication of water disputes. Section 13 of the ordinances of Salt Lake of 1879 pertaining to irrigation waters says: "Any person aggrieved at the apportionment of water allotted to him by the watermaster, at his proportion of costs or at any other act, claimed to have been done by virtue of the provisions of this ordinance, shall on written complaint be heard by the city council who shall constitute a board of equalization to hear and determine such complaints. But such complaints must be presented to the council within ten days from the origin of the act complained of. Said board may remit or abate for insane, idiotic, infirm, or indigent persons the tax or fee." All the cities by ordinance exercised similar authority but as we shall see the water-master had authority to act upon cases in the first instance.

During the irrigation season, water needs constant attention day and night. To render such service would not be consistent with the duties of the members of the council. Even when the city was small there were several matters requiring their official attention besides irrigation. Besides, their salaries were merely nominal and they were expected to act more as advisers to the active officials. The council divided itself into committees the members of which faithfully gave much time and attention to the work. There was a committee on irrigation that gave freely of its time to help locate canals and adjudicate difficulties which arose. However, when the control of the waters were taken over by the city from the bishops it became apparent at once that some central authority must control irrigation water flowing in the natural streams and through the canals and ditches so the council appointed a city water supervisor or water-master who immediately took control over the entire irrigation system subject to the supervision of the council. One of the strong reasons for taking irrigation matters out of the hands of the several bishops, in fact was to provide a centralized and uniform system of management.

The city water-master was elected annually by the council. At first he was paid by the day or by the acres under his supervision, but as the work grew the salary was fixed by the month, for the irrigation season, and finally by the year. It was not long before one water-master could not control the larger streams and canals and attend to the distribution of the water among the users, so assistant water-masters were nominated by the users of water upon the canals and then they were officially appointed by the water-master whereupon they were given certain canals to supervise. In every city investigated, the assistant water-master had to look to the water users for their compensation, whom they served. In Provo, Ogden and Salt Lake Cities in the earlier days the cities were divided into subdivisions known as wards and over each ward was placed an assistant water-master. In Logan an assistant water-master was placed in charge of each canal flowing through the city. Mr. E. F. Sheets, water-master of Salt Lake City, in a report dated September 10, 1855, set forth that he had divided the water among the several wards to the best of his ability; had appointed a water-master for each ward; and had put in gates at the different inlets into the city. His claim against the city was $33.00 for services from July 12, to Sept. 10, 1855. In this claim a charge of three dollars a day was made for the actual time spent in the service.

A city ordinance of Salt Lake City, in 1860 defined the duty of the water-master much as they had been exercised for the past seven or eight years, and it is cited merely to show what they were. "It shall be his duty to see to the erection of gates, locks, and sluices as may be necessary to admit into the city the waters rising and flowing therein and divide the same through the city as shall best serve the public interests for irrigation, domestic and other purposes. Also to appoint assistant water-masters in each of the bishop's wards of the city." The Provo ordinance of 1864 is almost word for word like the Salt Lake ordinance except that the water-master appointed the assistant water-masters of the various wards only when the farmers failed to do so. This, however, was soon changed, giving to the city water-master full power of appointment in case of assistants. In Ogden City the water-master was required to make and present to the council each year before April the first an estimate of the cost of cleaning and repairing the canals; and to divide the water flowing into the city in such quantities among the users as will serve the public interest for irrigating purposes.

The Logan ordinance is of a more recent date. It defines the duties of the water-master as follows: "It shall be the duty of the water-master to regulate within the city the waters flowing therein and divide the same through the city as shall subserve the public interest for irrigation, domestic or other purposes and under the direction of the city council; to see to the erection of dams or sluices as may be necessary and to adjust all difficulties arising from the distribution of water." These various sections of different dates gave a general idea of the duties of these officials, for the problems were much the same in all of the cities.

In most of the cities, the users of water were required to make written application for the water desired for the year, and before the first day of April the water-master was required to make the apportionment of water to the several gardens and farms. This apportionment did not provide for a continuous flow. From the earliest history of Utah water has been used in rotation. Each farmer being allowed so much water for so many hours. The periods of rotation are as far apart as possible according to the nature of the crops. Generally the size of the stream apportioned to an irrigator was as large as one man could control. In early days it was generally known as an "irrigation stream," a rather indefinite measurement which is still used in some localities. Now, however, the better measurement is by second feet. The rotation method of apportioning water makes for so much more economic use where the farms are small than the continuous flow method. This is especially true in case of small streams.

In making these allotments of water it is interesting to notice the principles underlying the division. For the community system of settlement employed in Utah, actuated as it was largely by religious motives, an apportionment of water based primarily upon the amount of labor furnished for the construction of the canal would not care for the incoming new settlers, who came individually or a few at a time. The new settlers could not enlarge the canal before they produced a crop. It must be understood that the Mormon Church in its colonization nearly always, in the first instance sends out enough families to undertake a cooperative construction of the canals, roads, and other public undertakings. In the humid regions the individual reclamation of farms could be undertaken, provided the Indians were under control, but this was impossible in the arid regions for the poor colonizer. In undertakings of any size, the canals had to be built collectively. By this it is not meant that the first settlers upon a stream exhausted the supply of water or cultivated all the available lands. There were ordinarily plenty of openings for additional settlers if they were allowed to use enough water to produce crops until they could enlarge the canals and increase the water supply. This was the policy ordinarily pursued and the one that enabled the new comers to get a start.

DUTY OF WATER

In early Utah, the use of irrigation water in the cities and the territory was considered from the point of view of public benefit or utility. An ordinance of Salt Lake City, in 1866, in defining the duties of the watermaster says that he shall divide the water flowing into and through the city "as shall best serve the public interest for irrigation, domestic and other purposes." A new ordinance in 1879 dealing with the same subject provided that the water should be allotted "among the applicants entitled to use a portion of said water with respect to time and quantity of water, according to the extent of land specified in the respective applications." The ordinance of 1883 said that the water should be divided according to the "amount of water available in proportion to the quantity of land."

The Provo ordinance of 1864 said that the watermaster should divide the water among the several canals "as shall best serve the public interest for irrigation, domestic and other purposes," and the assistant watermaster was required to divide the water among the users from the canals under his control, "as he may deem necessary and just."

An Ogden ordinance of 1870 requires the watermaster to divide the water among "the inhabitants in such manner and quantities as shall be just." These selections embody the spirit that made the early settlement of Utah possible and successful. It was a spirit of "live and let live." Not how much water could be beneficially used but how little was necessary for crop production. How much could be spared to the new comer in a settlement so that he could produce a crop. It was not necessarily a question as to whether he had worked for the water but did he need it, and would the dividing with him actually and seriously injure some one else. In other words what was the best duty of water for the community? The Mormon Church and the community spirit made this system territorial in extent. It was the same spirit that created small subdivisions of land and, where necessary, economical and beneficial use of water. It was the cooperative spirit that became the foundation stone of the State.

TAXATION

It has often been maintained that the real test of control in government is the authority exercised over taxation and expenditure. In the securing of revenue for the maintenance and upkeep of canals two forms were exercised. First in the construction of canals the common method was to have the irrigators supply labor somewhat in proportion to the water they desired for their land. This system was not followed strictly for the widows, the cripples, and the aged were often exempt or partially so from construction charges and as has already been pointed out the new comers were frequently supplied water first and the labor done afterwards. But the common method in the cities or on the outside was cooperative community undertakings, there were however exceptions. Besides construction the canals had to be operated.

For the purpose of keeping the system in order prior to 1855 Salt Lake City levied a tax of twenty cents an acre on farm lands, but gradually increased it to forty cents an acre. The levy on the city lots was about one dollar each. These taxes were payable in money or its equivalent and were used to repair or install headgates and flumes and to pay the water-master's salary. Naturally the levies varied from year to year as the necessities required. As the levies were ordinarily made early in April they were based upon an estimate furnished to the council by the water-master.

In addition to the foregoing levy the farmers were required to supply the necessary labor for canal cleaning. The requirements of each farmer were in proportion to the acreage irrigated. A failure to do the work and pay the taxes resulted in a denial of the use of water, unless the city council remitted both levies which was frequently done to those unable to pay them. In 1878 the city council levied a tax of one and one-fourth mills on all the property of the city. So far as can be determined, taxation was resorted to again and again. In the case of any emergency caused by a flood requiring an additional expenditure the council made an emergency levy. The expenditures ran from $1603.20 in 1879 to $11,587.39 in 1889.

In Provo the same policy was pursued in respect to the cleaning of the canals and ditches, i. e., the farmers were required to do the labor. An additional tax of one dollar was levied on all city lots and fifty cents an acre on the farm lands. In Salt Lake these taxes were all payable before the delivery of water. The policy of collecting in advance was tried in Provo for over twenty years, but in 1872 the levy for irrigation purposes was made collectable in the fall at the office of the city treasurer. The tax for 1918 was one dollar per acre for the farm lands and seventy-five cents for each city lot. The councils of both Salt Lake and Provo had almost regularly appropriated small sums for the support and maintenance of the different canal systems entering the city.

Brigham Young as Trustee-in-Trust in 1862 had offered to invest $50,000 of the Mormon Church funds toward the construction of the Jordan Canal. It remained for Ogden City in the case of the Weber Canal to set out boldly in the construction of an irrigation canal by taxation. In 1852–4 Ogden City spent $4562 upon the Weber Canal. Of this amount $1805.45 was appropriated from the city treasury and $2756.97 borrowed from the county. The plan was to pay the county the money borrowed, but when the city could not do it the county was persuaded to accept water stock in lieu of these loans. In 1853 the county loaned the city every cent it collected except a small amount to meet incidental expenses. The farmers did all they could in the way of labor, receiving in payment water for their lands. The creation and success of the Weber Canal meant the life of the community and every agency was employed towards its construction. For many years city funds were appropriated toward its betterment and enlargement. The records of these early times are incomplete and it is now possible to get only a glimpse of what was done.

In 1870 the city appropriated $700 toward the completion of the Ogden Canal. In the end the city lost control over these canals and also forfeited the funds expended. It was, however, a splendid investment. It meant greatly increased returns in taxes as a financial reward and better than all it meant the establishment of prosperous communities. In the light of these experiences it is interesting and even amusing to hear some of our irrigation reclamation advisers tell how irrigation colonization should be carried on, and made to pay from the beginning.

The maintenance and operation tax in Ogden in 1853 was $3.00 for each city lot and $1.00 per acre for farm lands; in 1855 lots $1.50 each and farm lands 50 cents per acre; in 1861 lots $3.00 each and farm lands 75 cents per acre; in 1865 lots $6.00 each and farm lands $2.00 per acre; in 1868 lots $4.00 each and farm lands $2.00 per acre; and in 1872 lots $2.00 each and farm lands $1.00 an acre.

The canals in Logan were built by the farmers and flouring mills before the city was incorporated. The charter, however, gave the city control which was exercised from 1866 until 1892. For several years the city levied an acreage tax for maintenance and operation. The city employed and paid a water-master whose duty it was to control the water flowing into and through the canal within the city limits. Beginning in 1871, the acreage tax being unsatisfactory, the city levied annually for twenty years a tax of one and one-fourth mills upon all the taxable property of the city for the maintenance and operation of the canal system within its limits. This was expended by the city water-master for the construction of headgates and dams both in the canals and in Logan River. If there was a balance, it was applied upon the salary of the water-master; if a deficit it was made up from the general revenues of the city. In the upkeep charges the city required the mills to bear one-third. As these taxes fell upon considerable property not directly benefited by irrigation it tended to lighten the burden upon the farmer in the cost of maintenance and operation. By this arrangement the farmers supplied the labor necessary for cleaning the canals and paid the assistant water-masters on the canal that furnished them water; all other expenses including the water tax on the city lots was borne by the city. The control, notwithstanding the financial relief, was not satisfactory to the farmers and the city finally surrendered it.

CHAPTER VII

IRRIGATION DISTRICTS

By several writers it has been maintained that the Wright Irrigation District Law of California was a new departure in irrigation institutions in the United States as well as the first of its kind. A study of its history at home and in foreign countries reveals the fact that the Wright Act was not the first of its kind and that in all probability its author was familiar with similar foreign institutions. A careful study of an earlier attempt, in the Utah Irrigation District Act of 1865, shows that it possessed the essential features of the California law that came thirty years later, except the authority to issue bonds, which right, unregulated as it was, in the great majority of cases, brought disaster upon the districts organized under the Wright Act.

The Utah Act of 1865 provided that whenever a majority of the citizens of any county or part thereof represented to the county court that there was plenty of unappropriated water which if applied to the cultivated or to the uncultivated lands would greatly improve the agricultural interests of the county, the county court was authorized to organize the whole county or a part of it into an irrigation district. The conditions of organization were that the farmers included should have water according to their needs.

The citizens of an irrigation district after they had been organized by the court were to meet in a mass meeting and elect *viva voce* not less than three nor more than thirteen trustees, a secretary and a treasurer, and at the same time to decide whether the tax which was to be levied should rest upon the lands to be benefited or upon all the property within the district.

The duty of locating the proposed canal, of determining the land to be benefited, of estimating the costs for claims, flumes, and the like, in the canal itself and the taxable property rested upon the board of trustees. The estimates when made were reported to the County Court. After this report, containing a careful estimate of the entire cost of the proposed system was in the hands of the court, the court was required to give six days' notice of a public election. A polling place was then provided for each precinct and the electors were asked to vote upon the following propositions. "First; do you mutually agree to pay per cent. property tax or per acre land tax to construct the proposed ditch or canal? Second; do you approve the action of the mass meeting in the election of officers?" The votes were counted and if two-thirds of the votes were in the affirmative the tax was levied and collected by the county officials. It was, however, provided that not to exceed one-half of the tax levied shall be collected at one time. The remaining part was to be collected as the work progressed. If fewer than two-thirds of the votes cast were in the affirmative all of the previous proceedings were declared void. If the voters were not in favor of the officers chosen, new officers could be chosen without interfering with the organization of the district.

The officers were chosen for a term of one year and placed under a bond.

If the levied taxes were found to be insufficient to complete the project the trustees could ask for an additional levy based upon further estimates. The request could be voted upon at any regular election and if carried by a majority of two-thirds would be assessed and collected as were the first taxes. The organization of the board of trustees consisted of a president, a secretary, a treasurer and such other officers and employees as were essential to carry on the work of the district. The board was required to keep a correct account of all its receipts and expenditures, and complete minutes of all meetings held, and a record of all contracts entered into. Annual reports of each district were required to be made to the legislative assembly.

The trustees had the right to sue and to be sued in the name of the district and to hold such real and personal property as may be necessary for the conducting of the business of the district.

If the voters thought it desirable to appropriate water originating in another county they could do so, providing it did not injure any individual in the community. The right of the exercise of eminent domain was not allowed except for the right of way of the canal. The right to construct reservoirs was granted but restrictions and limitations were placed upon them as well as upon the use and appropriation of water.

On the completion of the canal and dams, they were to remain under the control of the irrigation district. The upkeep was provided for by a tax levy upon the land or property holders as the case might be. In case it was desired to enlarge the system it was decided by a two-thirds majority vote and the necessary tax levied in the manner already outlined. The districts were held liable for damages for the break of any canal or dam. The damages were to be determined by an arbitration committee of three.

The act, as passed in 1865, was applied only to canals, dams, and reservoirs to be constructed; but in 1866 it was amended so as to admit of canals, dams, and reservoirs already in existence taking advantage of its provisions.

Considering the fact that the land office did not open for business in Utah until April 1, 1869, this act went just as far as it could go. It provided for the collection of the tax levies in the same manner as the regular taxes. Of course it did not provide for the sale of the lands in the event of a failure to pay the taxes, since the settlers had only squatters' claims to their lands. The act was so drawn that just as soon as such means could be employed to collect territorial taxes it could be employed for these taxes.

The law did not provide for bonding the district as did the Wright Act but what bonding value did these lands have in the Far West in 1865 before even a railroad had been built across the continent.

The bonding features of the Wright Act were largely responsible for considerable high finance and the consequent failure of so many projects organized under it. The facts were that taxation was the only feasible method of providing an irrigation system for these arid lands. It was the faith of the men who expected to use the lands to produce crops and who were willing to pay their taxes in labor in order to secure water for their soil that made the system a success. There was no speculation found in Utah districts, except the chances that the settlers were willing to undertake to establish homes. If the same spirit had been back of like undertakings where bonding was so largely resorted to, fewer bonds would have been issued and more of the enterprises would have been a success. On the contrary, in too many instances, projects were undertaken by promoters who hoped to make a fortune for themselves and cared little for the ultimate success of the undertakings only in so far as it furnished good speculative returns. This end was entirely foreign to the aim and purpose of the Act of 1865.

A few districts were organized almost immediately. On January 25, 1865, the County Court of Salt Lake County undertook to organize into an irrigation district the territory on the east side of the Jordan River. The records state that upon the request of the people occupying this land and desiring to secure more water for irrigation the court ordered that "all that portion of Great Salt Lake County lying east of the Jordan River be and it is hereby declared an irrigating district and designated the Deseret Irrigation and Canal Company." The law was complied with fully and the organization completed. The canal to be constructed was to be 32 miles in length, 20 feet in width at the bottom and capable of carrying a stream of water three feet deep. It was estimated to cost $403,000 and to irrigate 21,750 acres of land. An interesting feature of the proposed system was that it was to be provided with locks and the canal was to be used for transportation. It has a curious connection with the period of 1840–50 in the Eastern States when canal construction for water transportation engaged the activities of the towns, counties and states and private corporations. The development and construction of railroads twenty years before had made the eastern canals for transportation purposes unnecessary and in most cases economically inefficient in competition with the railroads. The same thing took place in Utah with the advent of the railroad in 1869. The directors of this proposed system which was not built, included Brigham Young and other leading men of the territory.

In 1867 the territory west of the Jordan River was organized into a district on petition of the citizens owning the land. It had the same purpose in view namely, irrigation and transportation. It was known as the West Jordan Irrigation District. Three irrigation districts were organized in Utah County in 1865 and 1866. Notwithstanding the unsatisfactory conditions of the county records on such matters it would be a conservative estimate to place the number of such organizations in the territory at about a hundred. In Cache County alone there were twelve such organizations. That was about the highest number in the State for one county but several counties organized six or seven districts.

In the working of the law certain features had proved especially defective. The law of 1865 made it necessary to levy all the tax at one time. Half of it was to be collected at once but one-half could be deferred. The law of 1878 made it obligatory to give ten days' notice through a newspaper having general circulation in the district and also to post notices in three public places of any district meetings held to consider estimates of canal costs or to levy a new or an additional tax. It repealed the provisions which allowed the district organization to levy its tax on all the taxable property of the district and made it a charge upon the farm land to be irrigated. The law of 1882 increased the term of the trustees to two years. The law of 1884 made some changes but it mainly concerned itself with codifying amendments previously passed. The law of 1884 did, however, make it specific that water would not be supplied according to the needs of the farmers unless they paid their proportion of the construction and upkeep of the canal. The user in the event of a failure to pay his taxes not only lost the use of the water but also his right to vote and hold office. The law of 1865 made the taxes collectable the same as territorial taxes. At that time the settlers did not have title to their land so the lands could not be sold to pay the taxes levied. But as the years passed the lands were surveyed and titles were issued by the Government to the occupiers, and then water taxes became a lien against the property. It was obviously not intended in the law of 1865 that the taxes of the irrigation district should be a charge against the land, but as the law stood it was open to that construction, so the law of 1884 provided: "That no tax created or payable by this act shall be or create a lien upon the land."

It also provided that "not to exceed one-half of the tax shall be collected at one time and the residue as the work progresses." Amendment of the law by the act of 1892 provided that the vote should not be per capita as it had been in the past but the owner of water should have a vote for each acre of land watered.

This was a logical move after placing the tax upon the land according to the acreage and freeing the town property from any of the burdens. By the same law the taxes were made a lien upon all water rights. The irrigation district law was repealed in 1897 except for the districts already organized.

The irrigation districts of Utah were in reality cooperative organizations for canal construction. Much of the canal construction had been done in Utah by voluntary cooperation but as is true in all social undertakings there had been a certain percentage of "slackers" and the irrigation district plan proved an effective means of compelling such men to do their part in the construction of canals and dams. That is the reason why the act took hold so early and that such a wide application existed in the territory. In the organization of the districts some serious mistakes were made, chief of which was the inclusion of large areas in each district. The included lands divided themselves into two classes: First: large areas were included that could not be irrigated by any system of canals; and secondly lands that were capable of irrigation but were not covered by the canals as built. In the early stages canals were planned and built to supply water to the most accessible arable lands and the lands receiving water were taxed for construction, maintenance and upkeep. No taxes were levied upon accessible lands of the districts that did not receive water.

For some years such an arrangement proved satisfactory, but as population increased and new settlements were established in the districts demands were made upon the district organization to build new canals or to enlarge old ones to supply the needs of the new land it was proposed to bring under cultivation. In general these requests were promptly refused upon the ground that the system already in existence was all that was intended and that it would be an injustice to levy a tax upon the lands already under cultivation to enlarge the old canals or to build new ones to supply the new lands when they had not been taxed to build canals in the first instance. There was some justice in this contention due to the policy of not taxing in the beginning all arable lands for the construction of the system. On the other hand, no other legal organization was possible for those within the district who were not receiving its benefits.

In the case of Harris v. Tarbet the Supreme Court of the State held that the whole area included in the district was under the control and jurisdiction of the authorities of the irrigation districts for irrigation purposes and that they had no authority to establish arbitrarily a limit to the system of a district or to confine control to a certain part of the system or to include or exclude certain lands in the tax levies for construction, maintenance and upkeep, but that all lands must be taxed. This decision led to a rapid disorganization of the districts, for many of them embraced arid lands much greater in area than the irrigated lands. In several districts the positions of these lands were such as to make it impossible to irrigate them at any time. In other cases the districts embraced swamp lands needing drainage rather than irrigation. It would be obviously unjust to tax such lands for the upkeep of an irrigation system, so the districts were disorganized and the canals were organized into stock companies which were very feasible organizations, especially as the use of water grew more valuable and taxes could be levied directly on the stock for the canal expenses.

A new act was passed in 1909. Twelve years had elapsed since the repeal of the old law. The demand came this time from those who wanted to proceed more along the lines of the Wright Act of California and bond the land for the construction of reservoirs, dams and canals. The law provided that the initial steps were to be taken by a majority of the land owners of the proposed district, who at the same time owned a majority of the whole number of acres to be included, petitioning the Board of County Commissioners for the creation of an irrigation district. In 1917 the law was amended so that the Governor of the State also had the right to file such a petition. This was done because the State had constructed reservoirs and canal systems and it was thought that as the lands were settled it would be advantageous to deal with the settlers, if they were organized into an irrigation district.

Notice of the intention of any one to petition the Board of County Commissioners for the creation of a district must be given by publication for two weeks in a newspaper having general circulation in the county. The notice must state the time and place where the petition is to be presented and give a general idea of the territory to be included. At the hearing held by the Board of County Commissioners they must check the petition to see if it includes enough names and a majority of the acreage intended to be covered. They also have authority to include lands not mentioned in the petition upon the request of the owners and to exclude lands included in the petitions if they are to receive no benefit from the proposed system. They then define the exact boundaries of the district, divide it for administrative purposes into three subdivisions and ordered an election. At such elections owners of agricultural lands are entitled to cast one vote for each acre or fraction thereof owned by such elector. The ballots were to read: "Irrigation District Yes" or "Irrigation District No," also the names of the nominees for the positions of directors. In order to check as to the correctness of the number of acres voted by each elector, it was required that the voter sign the ballot. If the election shows that the majority of the legal electors have voted in the affirmative the Board of County Commissioners shall declare the territory duly organized as an irrigation district and the persons receiving the highest number of votes elected as directors. The law prohibits the organization of more than one district for a given territory. The Board of County Commissioners is required to file a map of the district with the County Clerk after which the affairs are turned over to the duly elected officers. The organization of the directors follows the ordinary course pursued by corporations in the election of a chairman, a secretary, etc. The law defines the duties of the board of directors "to adopt a seal, manage and conduct the affairs and business of the business of the district; make and execute all necessary contracts, employ such agents, attorneys, officers and employees as may be required, and prescribe their duties, establish equitable rules and regulations for the distribution and use of water among the owners of said land, and generally to perform all such acts as shall be necessary to carry out the purposes of this act." The Board has power in order to carry out the provisions of the law "to construct, acquire or purchase any and all canals, ditches, reservoirs, sites, water, water rights, rights of way or other property necessary for the use of the district."

An amendment to this provision in 1911 authorized the purchase or enlargement of canals already in existence but this was limited in 1913 by the requirement that an irrigation district could not purchase less than a controlling interest in any mutual water company. A further restriction was placed upon the board of directors in entering into contracts by requiring that all contracts involving between ten and twenty-five thousand dollars must have the written approval of a majority of the land owners of the district according to the number of votes cast at the last general election. If the amount involved exceeded twenty-five thousand dollars it must be ratified at an election.

Inasmuch as the entrymen on public lands can not have their lands legally included in the district the board of directors is authorized to enter into a contract with the occupiers of such lands to sell them water on the same terms as to members of the district. If, however, such contracts are against the wishes of the land owners of the district they may veto them within thirty days of their execution by a written protest of a majority of the landowners.

If the district has a surplus of water, it may lease or rent the use of the water to occupants of other land either within or without the district. The users of such water do not secure any vested right to it. The rental must not be less than one and one-half times the amount of the district tax which would be levied on the land if it were included in the district. It is also permissible for the owner of land and water in the district, with the consent of the board, to assign the use of part or all of his water to another for one year.

It is in the interest of the public welfare that private companies be permitted and encouraged to build reservoirs, dams, and canals, and appropriate water to be sold for irrigating purposes to land owners. If such companies were not permitted to operate, much of the land would remain undeveloped. In practically all the arid States such corporations are encouraged but are being more and more closely supervised by the States. But why should an irrigation district corporation be allowed to appropriate public water and to sell or rent the same for short terms where the purchaser or renter acquires no permanent interest but has his agricultural development menaced by this uncertainty? From year to year these renters are subject to the caprice and altered circumstances of an uninterested corporation. It is a safe proposition to say that a company should not be allowed under any circumstances to appropriate water and hold it free for rental on short periods of time contracts. Such a policy is injurious to the development of agriculture and consequently to state and national welfare. For a man would not consider building a home or reclaiming arid land by cultivation if the use of the water which is essential to success is so uncertain. If an irrigation district has a surplus of water users should be allowed to permanently appropriate it at a reasonable purchase price, if there are no lands in the district that can use it.

The law provides that for the purpose of constructing or purchasing reservoir sites, reservoirs, water rights, canals, etc., that any district may issue bonds. The directors must first form an estimate of the amount of money necessary to enlarge or construct the system which must be submitted to the owners of agricultural lands of the district for consideration. Immediately thereafter an election must be called by giving twenty days' notice by notices posted in three public places and by publication in a newspaper having general circulation in the county for at least three successive weeks. If a two-third majority of the owners of agricultural lands are in favor of the bonds the board of directors are authorized to issue the bonds. The law provides specifically how the bonds are to be paid so that there can be no misunderstanding between the district and the purchaser. Twenty years is the maximum period fixed for payment. The term may, however, be shorter if the land owners so fix it at the time when the bonds are issued. The provisions covering payments provide that at the expiration of eleven years the landowners must begin the payment of the principal. Beginning with a payment of five per cent. of the total amount of the bonds, at the end of the eleventh year, the payments increase one per cent. each year on the original amount until the bonds are paid.

The bonds must be sold at public sale after proper notice in a daily newspaper of Salt Lake City, but under no circumstances can they be sold for less than 95 cents on the dollar. The bonds when issued become a lien upon the agricultural lands of the district. It is the duty of the Board of County Commissioners to levy each year a tax upon the district sufficient to pay the interest and principal as they become due, and in addition to levy toll charges sufficient to meet the maintenance and operating expenses of each year. For the purposes of this tax all the land in the district is assessed by the County Assessor at the same rate per acre. These taxes are collected by the County Treasurer the same as county and state taxes. The County Treasurer who is also the district treasurer is obliged by law to pay the interest and principal when due. Such payments are not subject to approval of the board as all other expenditures are. A failure to pay these taxes subjects the delinquents to the same penalties as apply to delinquents in county and state taxes.

An important provision of the act is section 51, wherein it provides that before any bonds are issued the board of directors of the district shall petition the district court to pass upon the legality of the proceedings involved in their issuance. Sufficient public notice is given and a day fixed when the court will examine all the papers and hear any evidence presented as to the legality of actions taken in connection with the issuance of the bonds. After all the facts are before the court the proceedings are confirmed in part or in whole or disapproved. If the money received from the first sale of bonds is not sufficient to complete the irrigation system others may be issued by going through the same procedure. The law does not fix a limit to the amount of bonds that can be issued but leaves it to the purchaser to look out for his own interest. It does, however, provide that in case the funds received from the sale of bonds are not sufficient to complete the system that taxes may be levied upon the lands. If this were not possible the whole expenditure might be a loss. For water two-thirds of the way to the land is no more valuable for crop production than when flowing in the natural channel.

The act of 1917 was passed in response to the request of the Reclamation Service of the Department of the Interior to make it possible for the settlers on the United States Reclamation Projects within the State to organize themselves into irrigation districts and assume control over and financial responsibility for the project. The changes in the new law are chiefly for the purpose of making it conform to the requirements of the United States Reclamation Service. An explanation of these requirements will be set forth in Chapter XIV. In the main the law of 1917 follows the law of 1909 and its later amendments. The points of difference will be considered here.

The Governor, on the recommendation of the State Engineer or of fifty or a majority of the owners of land requiring water, may petition the Board of County Commissioners for the organization of a district. In previous acts it required a majority of the owners of land to sign a petition, and if fifty is more than a majority, a majority is all that is required. The petition must request the Board of County Commissioners to form a district and to survey the lands to be included and allot the waters. When the petition is filed with the County Commissioners a copy is sent to the State

Engineer whose duty it now is to make a survey of the lands to be included and to allot to the lands the water or additional waters necessary. When the work is completed, the Board of County Commissioners gives notice of a public hearing to determine the exact lands to be included. The Board has authority to exclude all lands which will not be benefited by the system.

When the detail work is completed and filed in the office of the Board an election, after proper notice, is held by the landowners to determine whether they desire to form a district. By the act of 1909 the voting unit was an acre of land and a land owner was entitled to one vote for each acre; by the law of 1917 the acre-foot of water is the voting unit and a landowner is entitled to a vote for each acre-foot of water or fraction thereof used. A majority in either case is required to form a district. This change in the unit of voting is due to the fact that areas of land under reclamation projects are partially supplied with water and under such conditions the acre would not be a just unit, because it would give the user of six or twelve inches of water as much weight as the user of thirty-six inches. In earlier irrigation districts the acre served very well because ordinarily the district included only lands entirely to be supplied with water.

Provisions are also made for bonding the district. The bonds issued may be used for the payment of the obligations to the United States Government. It is incomprehensible, however, how a law passed supposedly for the benefit of the citizens of a State should permit the bonds to be turned over to the United States Government at 95 cents on the dollar when it is considered that they may bear interest and that they are a collective district obligation as compared with the present individual non-interest bearing obligation.

In the establishment of a reclamation project, the water becomes a lien on the public land. As the Government holds title to much of the land it can compel payment of the water dues before title issues or if title issues make it a lien on the land. A state corporation could not do that so section 12 provides that a district may enter into contracts with the occupiers of public lands upon the same terms as the owners of lands and that they shall have the same rights. The length of the payments of the bonds is extended from twenty years to forty years.

As the voting is done according to the acre-foot, naturally it follows that all assessments and levies are made on the same basis. Moreover the district may be divided into units and a different assessment may be made in the several units. As already indicated where the acreage was partially supplied with water an adjustment in voting power was made. The act likewise provides that proper financial adjustments shall be made for the ditches, canals, and reservoirs, already in existence. When a proper understanding has been reached between the board of directors and the old irrigators it shall be approved or modified and approved by the district court.

The foregoing are the chief changes included in the new act especially passed to enable the landowners under a reclamation project to organize a district and make a contract with the United States Government. In order to do this, they must substitute a joint obligation in place of the individual obligation. Under this plan, landowners become jointly liable until the entire obligation is paid. Under the Water Users' Association each landowner is individually liable for his own payment. But under the Water Users' Association plan the system remains under the control of the Reclamation Service until a certain percentage of the payments are made. In general this system of management has been so extravagant in its expenses of maintenance and management and so unsympathetic to the needs and wishes of the farmers that they are willing to submit to almost any terms to get into a system where they will have the management of their own affairs.

As a rule, the system of irrigation districts has not proved successful no matter in what States they have been organized. In a very large percentage the purchasers of the bonds have been very heavy losers. In some instances the bond holders have suffered a total loss. Utah suffered little loss because wisely, when little was known of irrigation, the districts did not possess the right of bonding. When men are spending their own money or labor they are apt to be more conservative with the result that careful investigation is made as to the quality of land and quality and sufficiency of the water supply before the enterprises are undertaken.

The writer maintains that the irrigation district law, devoid of state supervision as to the sale of bonds and the expenditure of funds, is fundamentally wrong. There is little care taken to safeguard the interests of the investor. Usually a legal process is provided whereby a district could be organized and that is about the extent of the state's control. In the majority of cases the bringing of water at the best is a highly speculative undertaking. When we add to this the advertising of the new undertaking in pamphlets, in a highly exaggerated form, it is not surprising that many investors have been deceived. In fact, when some sort of approval has been required by law from the State Engineer, it has been made to appear that the whole undertaking is subject to state supervision. It would appear that the least the State could do in the formation of an irrigation district is to measure and determine whether there is a sufficient supply of water of the proper purity; to measure the land and analyze the soil and pass upon it as to quantity and quality so that districts will not be undertaken with too small units or with unsuitable soil; to examine and pass upon the plans of the system and the estimate of costs, so that projects will not be undertaken that are financially impossible of completion or if completed will be unprofitable. The State should supervise the expenditures of the funds so that the purchasers of bonds would be assured that their moneys are legitimately spent for construction purposes and not largely to buy out the interests of promoters. Finally the State should assure itself that good drainage is supplied. Sufficient drainage should be a prerequisite required by the State in the undertaking of any irrigation project.

With the foregoing restrictions thrown about irrigation districts the risks would be considerably reduced. The Utah law does not supply any of the above restrictions and in general is as faulty as any of the laws of the Western States. Until some such restrictions are provided, about the only safe irrigation bonds in this or any other State are those of districts where the systems are already completed so that the cost and the efficiency of the system is known and the adequacy of the water supply is determined from usage as is also the quality of the soil for the production of crops.

NAME OF IRRIGATION DISTRICT	BONDS	DISPOSAL OF BONDS
Blue Bench No. 1	$155,000	Issued
Green River	$350,000	District bankrupt
Mapleton	$171,000	Issued to U. S. Gov.
New Hope		
Springville	$114,000	Issued to U. S. Gov.
Upper Blue Bench	$250,000	Voted but not issued
West Bench	$100,000	Voted but not issued
West Cache	$192,000	Issued

CHAPTER VIII

COUNTY WATER COMMISSIONERS

In 1880, the law of 1852 giving the County Court, consisting of the Probate Judge and the three county selectmen, control over the waters of the territory was repealed. The authority over the waters of the county, now considerably modified, passed into the hands of selectmen who became ex-officio the water commissioners of the county. Under the old law the commonwealth was a party to every water claim or controversy. It was part of the duty of the county courts to see that a proper apportionment of the water was made to each water claimant, so that the territory was insured a beneficial and economic use of its water supply. The officials of the several county courts had exercised this authority to the extent that the amount asked or appropriated, where it was excessive, was reduced or denied entirely where it was deemed against the best interest of public policy. The new law, however, was based on a different theory and a different policy was inaugurated.

Under the new law it was no longer the duty of the territory to enforce a beneficial and economical use of the public waters but merely to supply a means of adjudicating the difficulties which may arise between different appropriators and not concern itself as to whether the claims were excessive or not as long as each claimant was adequately protected. In issuing certificates to users of water, the water commissioners were inclined to grant the full request so long as no one protested. This policy resulted in grants so large as to be absurdly excessive. These large grants in many instances are in existence to-day and are very troublesome. The Weber County Commissioners granted in one case 49 second feet for two hundred acres where three would have been ample. It would be useless to cite a large number of such cases because they were not the fault of the water commissioners, but of the law which was theoretically and fundamentally wrong. It is doubtful, if in all the legislative history of irrigation a more retrograde piece of legislation was ever placed upon the statute books than the law of 1880. It was doubly harmful since the work of the county courts had laid such an excellent foundation for the next logical step, territorial control. The chief defect of the county courts had not been the principle upon which they were acting but the limit of their jurisdiction, circumscribed as it was by the county boundaries. However, in the early days when the counties were large and the irrigation systems in general not as extensive as they were to become later this limitation was not felt so much. If, instead of repealing this system it had been made state wide in order to meet the new conditions about to develop it would have been of incalculable value.

Section 1 of the Act of 1880 made the county selectmen ex-officio water commissioners of the county and defined their duties as follows: "to make or to cause to be made and recorded such observations from time to time as they may deem necessary of the quantity and flow of water in the natural sources of supply, and to determine as near as may be the average flow thereof at any season of the year, and to receive, hear, and determine all claims to any right to the use of water, and on receipt of satisfactory proof of any right to the use of water having vested, to issue to the person owning such right a certificate thereof, and to generally oversee in person or by agents appointed by them, the distribution of water within their respective counties from natural sources of supply, and to fairly distribute according to the nature and extent of recorded rights and according to law, to each said corporation or persons their several portions of such water; and in case of dispute between any of such persons or corporations as to the nature or extent of their rights to the use of water, or right of way, or damages therefor, of any one or more of such persons, or corporations, to hear and decide upon all such disputed rights and file a copy of their findings and decisions as to such rights with the County Recorder, and to distribute the water according to such findings or decision, unless otherwise ordered by a court of competent jurisdiction."

By this section, the water commission was authorized to measure the streams in their respective counties and record their flow. If this part of the act had been carried into effect it would have been of great value in the way of gathering information for future adjudication but very little along this line was done. It would be difficult to over estimate the value of such a fund of information, extending over a period of fifteen or twenty years. But the counties were poor, engineers were not available, the demands for water in most counties were not pressing and above all the county selectmen as a rule did not appreciate the coming value of such information. The unfortunate feature of this law was that the territory had no authority to intervene in a dispute to protect the public interests against excessive appropriation, a right the law of 1852 especially provided for.

In Section V, suits at law were provided for but not until after an examination and adjudication of the rights of the respective claimants by the water commissioners of the county. If, after the adjudication by the commission the parties to the controversy were not satisfied then they possessed the right to litigate the matter before the District Court. The water commissioners had the right upon their own initiative to adjudicate any stream within the county and to divide the spring or the stream among the lawful users. When the respective rights upon the streams were determined the commissioners made it a policy, according to the law, to issue water certificates which could be recorded in the office of the County Recorder. An appeal from the decision of the commission lay to a district court but it had to be made within a given time. On the contrary if the water commissioners failed to act upon the case for three months the case could be taken directly to the Dictrict Court. In several of the counties a large number of streams were adjudicated and passed upon and certificates issued and recorded. These adjudications in the most instances have stood until the present and in many cases undoubtedly will remain for many years to come.

An unhappy feature in many ways was the provision which established a vested right in the use of water. It reads as follows: "A right to the use of water for any useful purpose such as for domestic purposes, irrigating lands, propelling machinery, washing and sluicing areas and other like purposes is hereby recognized and acknowledged to have vested and accrued as a primary right, to the extent of, and reasonable necessity for such use thereof." This right was dependent upon the diversion of unappropriated water and upon the open, peaceable and uninterrupted and continuous use of the water for the period of seven years. These rights were designated as primary. The same act defined and established another class of rights known as secondary water rights which are as follows: "Whenever the whole of the waters of any natural stream or water course of supply has been taken, diverted and used by prior appropriators for a part or parts of each year only: and other persons have subsequently appropriated any part of the whole of such water during any other part of such year such person shall be deemed to have acquired a secondary right or in times of unusual increase in the flow of a stream exceeding the average flow for seven years, at the same season of the year the appropriators and users of this increased water flow shall have established a secondary water right."

If a system of measuring the streams had been established and carried on for a number of years it would have been possible to determine whether there were a possibility of secondary water rights upon the stream measured. Such a policy of water measurements was not pursued by the water commission and the secondary water rights established were in the nature of what was commonly called "waste water," but was not waste water but was in reality nothing more nor less than excess appropriation by primary users from the natural streams which had been allowed to run to waste. The users who possessed land situated below the farmer who made the excessive diversion called it waste water and appropriated it to beneficial use. Many appropriations of this so called "waste water" have eventually ripened into primary rights when as the years went by, the farmer making the original diversion, became satisfied that he did not need it at all.

A great difficulty in determining when secondary rights arose was the fact that the right to the use of the waters of a given stream was stated in fractional parts of the flow. In other words a user of a canal may be entitled to one-twentieth or one-fiftieth of a stream no matter as to the size of it. So if there was an actual increase in the stream the person or canal could appropriate the given per cent. of the stream, and it would not be waste water, until the users failed to apply the water to beneficial purposes. Until then the increased flow would not be discovered by persons desiring additional water. Of course, other methods of measurement were legal but owing to lack of familiarity with them they were rarely used. On the other hand the system of dividing the stream in fractions of the stream itself had a certain advantage. In case there was a decrease in the flow of the stream in late summer every user received a proportionate amount thereby enabling him to save his crops in part at least. When priority is fully established and each user allotted his water in so many second feet, the earlier appropriators may have plenty and the later ones none. Such was contrary to the spirit of the settlement of Utah where a religious organization had come to establish itself and could only, from the very nature of physical conditions, succeed by cooperative community action, so it was wise indeed that such a system was not introduced for it may have impeded the growth of the territory. At the same time it must be remembered that the percentage if held the same for the early spring flow may prevent the storage of the early spring waters.

From the earliest time there had been a limited amount of buying and selling of water rights. In fact it was more in the nature of the buying and the selling of labor. Where hundreds had worked hard and dug a ditch larger than was necessary to supply their land they often sold to a later settler part of their interest in the canal. The canal was in many instances dug large enough to supply new comers. Frequently the payment was made in labor itself. In few, if any parts of the territory, had the use of water reached the monopoly stage, so it can be truthfully said that in the early settlement of the territory, that what was known by the term water sale was no more than a sale of part of the work done on a canal. By 1880 in certain parts of the territory water was growing scarce and what began as an innocent practice by early settlers in the sale of the part of their interest in the canal easily passed over into the sale of water. From the sale of the actual labor done on the canal to a sale of part of the interest created by labor in the canal was a short step and to it could readily be added an additional amount for the monopoly value of the water. Unfortunately, water was not made appurtenant to the land but could be held legally as personal property. The law of 1880 legally established the right of the user of water to declare his water rights personal property and dispose of it as such.

Up to this time the foundation principle in the territory was that the water was appurtenant to the land and it was most unfortunate that any other doctrine ever received legal recognition. In an arid county the owners of the water are the masters of the land and the people, and when the water is held as personal property there is a grave danger that by purchase it may pass into the hands of the few and become a burdensome monopoly upon agricultural activity.

The act of 1880 still further provided that water companies could organize and conduct their business upon the corporation plan. Soon after the law became effective many canals were organized as companies and collected the operation and maintenance expenses by an annual assessment upon the shares of the canal. This has now become the common method of conducting the affairs of irrigation companies in the State. There are still, however, hundreds of small canals without any formal organization at all. The users of water from these canals simply meet annually and agree upon an assessment for the repair, maintenance and operation of the canal for the year and ordinarily pay the major part in labor. A small money levy is made to provide material for headgates, flumes, and to pay the watermaster. For the larger canals the corporation plan has proven itself the most satisfactory of any organization so far employed.

Shortly after the passage of the law of 1880, the water commissioners throughout the several counties became active in the adjudication of individual water rights where there were any controversies and also in the distribution of streams. A majority of the work done was of an enduring nature and it is in many instances the present basis of distribution. Hundreds of streams and springs were rudely measured or judged as to their flow and the water assigned to the respective users. It is only in exceptional cases that the distribution made has been questioned since. Where the courts have been called upon to re-adjudicate the old water rights, they have, in the main followed the old settlement.

Inasmuch as the work accomplished was so extensive and permanent, a study of the methods pursued will be of wide interest.

Acting in some ways like a court, the water commissioners adopted a body of rules to govern in the procedure of cases coming before them. As the rules for the several counties were very much the same those adopted by Box Elder County will be given in full.

RULES OF PROCEDURE

1. Meetings (date set).

2. All persons, corporations or associations claiming to have primary or secondary rights to any streams or water in Box Elder may file their claims with the Clerk of the County Court of said county who is also the clerk of the Board of Water Commissioners. At any time hereafter and upon the establishment of the same will be granted a certificate therefor.

3. The board shall appoint the time and place for hearing each claim and thereupon the clerk shall issue a notice stating the name of applicant or claimant and giving in general terms a description of the water right claimed, naming

the stream or spring and designating the time appointed for the hearing of the claim, copies of which notice shall be posted in three public places in the county or published in some newspaper as the board may direct at least ten days before the hearing and in all cases where there are known to be conflicting claims and adverse claimants in his application who shall each be served with a copy of such notice in the manner prescribed in Section 1719-1721 of the compiled laws of Utah Territory all of which shall be at the expense of the claimants but adverse claimants shall be liable at the discretion of the board for the cost of the unsuccessful litigation caused by them.

4. All adverse claimants shall specify in writing the nature and extent of their respective adverse claims, when and how they originated, etc.; and if the first claim be verified by the oath of the party, his agent or attorney, then the above party shall likewise verify his claims and the parties shall be held to the issues made and restricted in their proofs to them.

5. Any person desiring the attendance of witnesses shall be entitled to obtain from the clerk of his board subpoenas therefor, and the respective parties may obtain continuances for the proper cause and proper terms to be determined by the board and all applications, notice, proofs of service, adverse claims, subpoenas, findings and determinations of the Board of Water Commissioners shall become a part of the records in each case."

In case of a contest, hearings were had, both sides being represented, but rarely by counsel. As a rule the commission aimed to avoid such expenses. If it was deemed advisable the commissioners visited the stream and the lands to be irrigated, aiming thereby to come to a fair and just conclusion.

Before any claim or contest was taken up, notice was published in a newspaper having general circulation in the county, the following being an example:

NOTICE.

To Whom it May Concern:

Be it known unto all whom it may concern that, I, Frank Hyland, have this day filed my claim for a water right of the wat[illegible] of Birch Creek running into Muddy, and is situated about fourteen miles northwest of Terrace, and about six miles north of what is known as Plains Ranch, also for the water in Spring Creek near the same place and empties into the creek called Muddy.

FRANK HYLAND.
Brigham City, Utah.
Sept. 26, 1883.

If after the publication of the notice for ten days or more there were no remonstrance, the petition was granted as approved. Here was the weakest part of the act. In the authority granted to the County Court by the Act of 1852 the public was represented and the court made grants of water as would best "subserve the interest of the settlement in the distribution of water for irrigation or other purposes." Under the system inaugurated in 1880 excessive grants were made if it did not at the time interfere with the rights of other claimants.

At the conclusion of the hearing, if there was one, a certificate was issued to the user or users of the stream or spring:

CERTIFICATE OF WATER RIGHT

(Issued by the Water Commissioners of Weber County.)

The application or claim for water right of John Doe on file herein came and duly to be heard the 28th day of September 1880 and due notice thereof having been previously given as provided by the rules of the Board of Water Commissioners in and for Weber County, Utah Territory, and evidence thereof duly filed, the said applicant made proof to the satisfaction of said commissioners of the validity of their claim and right to the use of the water hereinafter described as claimed in said application and thereupon the matter was submitted and taken under advisement by said board and now being fully advised in the premises the undersigned selectmen and ex-officio water commissioners in and for said Weber County do find from the evidence adduced that the water hereinafter described has been taken and diverted from its natural bed and channel and it has been openly and peaceably uninterruptedly and continuously used by said applicant, John Doe, for irrigating the land hereinafter described for a period of more than fifteen years past and that he has a vested primary right to the use of said water.

Wherefore in pursuance of the provisions of the Territory of Utah, entitled: "An Act Providing for Recording Vested Rights to the Use of Water and Regulating their Exercise." February 20, 1880, it is hereby adjudged, determined and certified by the Water Commissioners that John Doe is entitled to a primary right to a portion of the water of Birch Creek, a stream having its source in Weber County, Utah, in common with all claimants who take water from said stream to the extent of reasonable necessity for irrigation of the following described piece of land, situate, lying and being in Weber County, Utah Territory.

(LEGAL DESCRIPTION OF LAND)

The right to use said water as aforesaid is hereby recognized and acknowledged to have vested and accrued as a primary right. The exercise thereof to be regulated by and under supervision of the agent or agents duly appointed by the provisions of said Act.

Witness whereof we have set our hands at Ogden City, Weber County, Utah Territory.

RICHARD ROE, Clerk.

L. J. HERRICK }
F. A. HAMMOND } Selectmen and Ex-Officio Water Commissioners.
A. G. TAYLOR }

The selectmen of Cache County acted as water commissioners from July 13, 1880, until some time in the eighteen-nineties. It is difficult to determine the exact date. During that period they settled the right of use of almost every stream and every spring in the county.

Serious contests were settled involving hundreds of acres of lands, some sixty-five contestants and an irrigation district. There were some 10 irrigation districts in the county and their rights were all adjudicated and the flow of water that they were entitled to determined. As an example of the work done Birch and Summit or Smithfield Creeks were investigated and the waters divided among the hundred of claimants. As already stated the right of the use of water whether to individuals or irrigation districts was settled and a commendable part of the proceedings was that it was relatively inexpensive and, in the main has remained undisturbed to the present, as an evidence of what can be done by the application of common sense to practical problems. It is not maintained that the time has not come for a revision. It has, but when it is accomplished a very large number of the former adjudicated rights will be left undisturbed.

In Salt Lake County, the water commissioners were very active during 1880 but after that year little was done. The rights of the users of water from Mill Creek by canals and by individuals were determined and the priority of each canal fixed. Streams such as Neff's Canyon, Butterfield Creek, Rose Creek, Emigration Creek were adjudicated. Parley's Canyon stream alone involved an adjustment among 289 users and 3530 acres.

In Box Elder County the water commissioners dealt with practically every stream and spring in the county. The irrigation district and some of the companies were dealt with as units. The adjudication involved 307 claimants and 429 water certificates were issued. The commissioners, as the law allowed water to be regarded as personal property, permitted it to be sold but required that the transfer be approved by them and recorded.

The water commissioners of Davis County adjudicated fifteen streams and one spring. They issued 306 water certificates and dealt with 633 applications.

The commissioners of Utah County distributed the water for 63 streams and springs and issued certificates to the users.

Weber County water commissioners adjudicated several streams and springs and issued 198 water certificates.

If this same system had been built upon by allowing the county water commissioners to employ expert advice, protect the public interest, and to receive judicial approval for the work done it would have proven ideal. As the State grew in population and integration, then the county water commissioners could have been consolidated into one state commission. The public doubts the wisdom of the past and looks afar for some new institution when a slight change in an old one would meet the situation better.

CHAPTER IX

THE DISTRICT OR TRIAL COURTS AND IRRIGATION

The County Courts and the County Board of Selectmen dealt with the adjudication of water mainly as administrative bodies. The questions of law were naturally passed on, but then, as now, in successful water distribution the soil and engineering problems constitute the larger part of the consideration. For these reasons the courts and boards, made up largely of laymen, were very successful. For the arid regions in the early settlement of the West, unless they followed the law of water as applied to the humid region, there were few rules of law or custom that could be applied. The path was new and unbeaten and common sense was the only guide. Cases found their way to the civil courts but they were surprisingly few in number in comparison with thousands of distributions made and hundreds of disputes settled by the County Courts and the several Boards of Selectmen.

DISTRICT COURTS

However, the repeal of the laws of 1852 and 1880 left the civil courts as the only means by which water could be apportioned or disputes adjusted. Under the Act of 1852 the rights of the commonwealth were protected against excessive or improper appropriation because the waters were distinctly held to be the property of the people. The act of 1880 did away with this idea but in practice the Board of County Selectmen pursued this same idea as far as possible. There was no means of enforcing the grants but new settlers were accorded rights in community canals and public streams that could not have been obtained in an ordinary court of law. A thorough consideration of the principles evolved by the county courts convinces the careful investigator that they were highly beneficial to agricultural and communal welfare.

As a means of comparing the work of the district courts with the county courts, already considered in Chapter V, a few cases adjudicated by the district courts will be briefly considered. Since 1890 and especially since 1896 the water cases tried before the district courts, particularly in the Sevier River Drainage District, have been very numerous. It would be profitless to consider many for they do not involve fundamentally different principles.

In the case of Ebenezer G. De Friez et al v. Ashley Central Irrigation Co. et al, 1897, the court in dividing the water followed the old custom of granting each user a percentage of the flow of the stream, and to have the same flow uninterruptedly into and through its canals, and in fractional parts of the stream. As has already been observed the awarding of water rights in fractional parts of the stream was an early development. It had certain advantages when measurements were inaccurate and could be readjusted at the pleasure of the county courts. Here the same system was employed where the rights became vested, and could not be readily changed, a policy which required a more accurate system of measurement. Moreover the court in this case decreed that the "appropriator shall have the same flow uninterruptedly into and through his canal." In irrigation, the phrase, an "uninterrupted flow" is wholly undesirable, if it means what it says, because it tends to water-log the land. Besides it would tend to interfere with the storage of early waters in reservoirs.

In the case of Tidwell Canal Company v. the Pioneer Ditch Company, 1904, the waters of the Price River were awarded to certain canals with "sufficient waters to irrigate a given area." The waters of each canal were then decreed to the several users with "sufficient water to irrigate" a given number of acres as set after the appropriator's name. Variation from this indefinite award was made in case of grants to municipalities and railroads where definite measurements of water in second-feet were made. After decreeing to the numerous users "sufficient water" to irrigate a given acreage the court in the latter part of the decree specified that for 1903 the duty of water should be one second-foot of water for each sixty-five acres of land. At the same time the court appointed a water commissioner (water-master) to carry out the decree of distribution, using the above "duty of water as a basis of said distribution during the said year, provided that if said commissioner upon careful inquiry and observation shall find that said duty of water is too high or too low for any specific parcel or parcels of land he may, at his discretion, decrease or increase said quantity of water so as to sufficiently irrigate said parcel or parcels of land."

After issuing the decree the court, as the foregoing quotation clearly indicates, turned the real adjustment over to the water commissioner. With its limited information the court did the proper thing. In fact what else could the judge do with his lack of knowledge of irrigation engineering? What do the opponents of the Oregon and the Wyoming systems have to say to this procedure? If it is granting judicial authority to a water commissioner to distribute water before the case comes before a court is it not equally so after the court has adjudicated the difficulty if the court gives a water commissioner authority to change its decree at his discretion? In fact the court showed its wisdom in turning over the problem to an engineer. The facts are that the apportionment and distribution of water is largely an agricultural and engineering problem and should be carefully investigated and passed upon by an administrative body before coming before law courts.

In the case of the Richfield Irrigation Company et al, v. Circleville Irrigation Company et al, 1906, the water was decreed in the main in second-feet. In several awards, however, the claimants were given "all of the waters" of a designated spring or stream. The decree was based in the main on the old usage which had prevailed in the community for years. The decree embodied usage rather than scientific information as to the flow of streams and the needs of the soil.

In Provo Reservoir Company v. Provo City, 1917, the terms of the decree were in second feet but the principle involved was the awarding of all the stream to the claimants. The court says "The duty of water upon such streams shall, during the high or flood water period, be forty acres for each second foot; and during the receding waters the duty shall be upon a graduating scale decreasing to sixty acres per second foot." The flood waters come in the spring at the same time that spring rains occur. The query then naturally arises why does the land in the spring or moist season need one second foot of water to forty acres whereas in the dry summer season it needs only one second foot to sixty acres, except on the principle that all claimants shall be given all they ask at any season, provided there is enough to go round? For it is generally recognized that one second foot for sixty acres is more than ample except in gravelly soil.

The unfortunate part of such a method of distribution is that it awards the spring flood waters, which should be available for storage, to parties who do not and cannot use them and who allow them to run to waste. To obtain the right to store these waters in reservoirs usually means another expensive law suit to prove that the early waters are not beneficially used.

A study similar to the foregoing could be continued through a large number of cases, but the conclusions arrived at and the actions taken by the courts were much the same in every instance. It would therefore be a wearisome effort to present them in detail. A general consideration of the irrigation problem before the district courts would serve the reader's purpose much better. The United States Department of Agriculture in Bulletin 124 made a careful study of forty cases brought to trial in the Sevier River drainage basin. The conclusions reached after an extended study are very valuable and present a clear analysis of the situation as it stands before the trial courts. In lieu of an extended discussion the conclusions reached and the suggestions offered are quoted:

> The foregoing outline states in brief the purpose, character, and result of the forty suits over water rights on Sevier River and its tributaries during the past sixteen years. With the exception of two or three minor cases, the papers of which are lost from the county records or whose titles search failed to disclose, and the case of Kraft et al., affecting Sevier River below Deseret, the outline is believed to be complete.
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> In deciding the efficiency of the litigation on Sevier River in determining rights to water for irrigation, there are obviously two main grounds to consider, (1) has it worked justice between the parties to the litigation; and (2) has it worked justice between the litigants and the public? It is safe to assume that if it has failed on either or both of these grounds it has not been final, because no matter how far-reaching or how well supported by legal doctrine the decrees may be, if they are right, if the interests of all concerned, whether individual or public, have not been fully and carefully guarded, the time will come when they will be set aside and the issues threshed over until justice is done. And if it should be found that the litigation has not fallen short on these two grounds, the query would still be pertinent as to whether the process of the courts, counting time and certainty as well as money considerations, has not been more expensive than was necessary or than the benefits which have accrued to the irrigators have warranted.
>
> ### EFFECTS OF LITIGATION ON THE RIGHTS OF LITIGANTS
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> To answer the first query it will be necessary to refer to some of the significant features of the litigation.
>
> ### FAULTY BEGINNINGS OF ADJUDICATIONS
>
> When a suit seeking the ending of an alleged trespass on a water right or a quieting of title to the water of a stream

is filed, it is the practice for the plaintiff to claim adversely to the defendant the entire stream in question, basing the claim for instance, on an alleged diversion of "all the waters of said river therein flowing from every source whatsoever," and alleging "the actual, peaceable, quiet, undisturbed, adverse, and notorious possession of said waters as against all persons whomsoever," except as interfered with by the defendants. This may be a good beginning for one individual seeking to end a trespass by another, yet it hardly seems a proper way for one hundred or more farmers to commence an action to define their rights to water. While it may have no further effect than opening the case for settlement it would seem that an order from the adjudicating authority directing each irrigator to present testimony as to the date and amount of his use would be more direct and less confusing to the farmers. Such a procedure would also rid the adjudication of the present objectional controversy between individual irrigators and make an issue between the State and the individual rather than between the individuals. To determine such simple facts as the capacity of a ditch and the area of land watered by it, facts which a mere survey will show, there seems little necessity or justification for extravagant and untruthful claims. No way for these simple facts to be presented in court by some disinterested officer was found in the course of the litigation of the Sevier. In one case, by consent of the parties interested, the trial judge personally viewed the premises in dispute, but in most cases such action would be impracticable if not inexpedient. In another case, the plaintiff introduced detailed plats to show the area watered by each party to the suit, and stood ready to support them by testimony of witnesses; yet the plats were not made from actual surveys and were prepared by interested parties, so that there was no assurance before the court other than that of interested witnesses that they were accurate.

EVIDENCE ON DUTY OF WATER

As it has been with the area of land watered and the fact of watering, so it has in a measure been with the duty of water. This is equally essential as a basis for adjudication, yet it is not mentioned in many of the Sevier decrees, although the courts have recognized and emphasized its significance in the recent important cases. In one an engineer was employed by one side to ascertain the duty of water in the different districts affected. His report was based on an examination of soil samples and under the circumstances could be no more than approximate. While the information he presented was of great value in the suit and showed that the importance of knowing the duty of water was appreciated, it was far short of a satisfactory basis for settling rights to the extent involved in this case, and should not be allowed to justify such a method when a better one is possible. In one case the court refused to render a permanent decree until such time as a court commissioner should have ascertained by measurement and study what the duty of water was and what the stream in question carried at different seasons of the year. A temporary decree was therefore rendered and a permanent decree will not be signed until the court is assured of its correctness.

EVIDENCE ON FLOW OF STREAMS

With perhaps the exception of that just mentioned, in none of the cases of litigation on the Sevier has the importance of a knowledge of the flow of streams adjudicated been recognized, or, if it has been recognized by the court, no steps have been taken or no way found to get this information in reliable form before the court. While there are no instances on the Sevier of the wide discrepancies between the flow of streams and the amount of water decreed, so common until recently in some sections of the West, the evidence on the flow of streams introduced at some of the trials was mere speculation. In most of the recent cases the practice has been adopted of ordering a prorating of the water in a stream among the holders of decreed rights of any class whenever the flow of the stream should fall below the amount decreed to that class. This practice is a natural result of the provision for prorating among the holders of primary rights in the

State statutes. Although it reduces the ill effects of decreeing water in excess of the flow, in no sense does it take the place of an exact knowledge of stream flow based on measurements extending over a sufficient number of years to show a reliable normal. It is of course true that exact information on this subject is not now available, yet it must be available before rights on the Sevier can be settled.

No decree has been rendered on the Sevier which is not liable to lose a part or all of its force by a later decree. It is doubtful if in one of the suits that have been brought to quiet title a majority of the water users concerned did not believe the suit was going to settle their rights so conclusively that they could never again be assailed in court. Yet this has not been the result in even the two most important cases brought to quiet title which have been decided — Richfield Irrigation Canal Company et al. v. Clear Creek Irrigation Canal et al., affecting the Sevier from the dam of the Vermilion Irrigation Company in the lower Sevier Valley to the headwaters of East Fork in Garfield County; and Deseret Irrigation Company et al. v. Samuel McIntire et al., affecting the Sevier from the canal of the West View Irrigation Company in Sanpete County to Deseret in Millard County. Many of the rights decreed in the first-named case are already being assailed in the case of Richfield Irrigation Canal Company et al. v. Circleville Irrigation Company et al., and the rights decreed in the other are sure to be questioned, if not in a suit affecting the water both below and above the canal of the West View Irrigation Company in Sanpete County, then in a suit which, if conditions continue as in the past, will come when water is more valuable and in greater demand for the wide areas of tillable land on the Sevier desert below the town of Deseret.

That issue will be taken with this statement is not doubted, yet if the history of past litigation on the Sevier is any guide to the future, there can be little question of its truth. No water user's rights are certain until they established good against all the world. A civil suit in law can affect only those who are parties to it. If only a portion of those using or claiming the right to use water from a stream or its supply are concerned, as has been the case in every suit thus far prosecuted on the Sevier, there is no possible way to prevent the rights established in one suit from being assailed in another. And the longer such an imperfect decree remains in force the greater is the injury done, because it deceives those affected into believing that permanent which in the nature of the case can not be so, a result which only too often engenders distrust of even that which is permanent.

Under the statutes of Utah, a plaintiff may make any or all persons who have diverted water from the same stream or source parties to one suit; or if interested parties are not represented they may enter the suit on leave of the court, by filing a complaint in intervention, joining with either the plaintiff or the defendant or making demands adversely to both; or their appearance may be ordered by the court when a complete determination of the rights can not be had without their presence. It is therefore rather surprising to still find suits being prosecuted which do not include even all of those using water from the immediate tributary or section of the stream. It must be said, however, that these suits are rather the exception than the rule, because the seven most extensive suits on the Sevier have aimed to include all irrigators within the territory embraced by the suit, even if they did not include all of the tributaries or all of the stream, as already explained.

ESTABLISHING WATER RIGHTS BY STIPULATION

A practice in water litigation on the Sevier which is common, and whose demoralizing influence is admitted and deplored by many, is that of settling the litigation by stipulation of the parties to the suit. In 12 of the 40 cases the final settlement was affected in this manner, while in a number of others, notably that of Richfield Irrigation Canal Company et al. v. Clear Creek Irrigation Company et al., stipulation was resorted to to settle some of the rights. In this case a committee of the plaintiffs, under direction of their attorney, visited each defendant appropriator in the case and endeavored to reach an agreement with him as to what amount of water he was entitled to. In some cases no agreement could be reached, but where one was possible, the following stipulation was signed by the defendant and the attorney for the plaintiff:

> It is hereby stipulated by the plaintiffs and the defendant, —— ——, that said defendant has for more than seven years prior to the filing of this action, used, and is entitled to a decree herein confirming his right to the use of sufficient of the water of —— to irrigate —— acres of land in —— County, Utah.
>
> That —— cubic feet per second of time, measured at said defendant's head gate in said stream, is the amount required to properly and economically irrigate said land, and the manner in which said water shall be regulated and controlled in the said use is the only issue herein which the court is called upon to determine between the plaintiffs and the said defendants.

While agreement out of court is in many respects preferable to contention in court, there is a point to which this agreement can not, in justice to all, be carried. That point is reached when stipulation is attempted between a well-selected committee representing a number of strong irrigation companies seeking control of all of the water that it is possible for them to get and an individual farmer who probably knows very little as to his requirements for irrigation when stated in cubic feet per second or any other definite unit of measurement. A stipulation under such conditions might or might not be fair to the individual, but even if it were, it might or might not be fair to the other parties of the suit. Such a committee would doubtless have a limit beyond which it would not go in conceding a right. Up to that limit, the quantity of water which each claimant would receive by the stipulation would depend more upon his assertiveness than on his right, and there will be no necessary uniformity in the basis of rights recognized by the stipulation. Obviously, the same standard should measure all like rights, and it is not to be expected that that standard will be applied by any one other than a disinterested person. While it may lessen the expense and trouble of settling a controversy in court to have one-half of it settled outside of court, there will be no assurance when a decree is rendered that the rights settled in court correspond to the rights settled outside.

Besides the injustice sure to follow the lack of a uniform basis in determining rights to the same stream there is a further objection to such stipulation as used in the case of Richfield Irrigation Canal Company et al. v. Clear Creek Irrigation Company et al., cited above. This arises from the possibility that such a stipulation may in a later suit be held to have determined only the rights between the parties to the stipulation. No case purporting to settle all of the rights on a stream has been found in which a stipulation has been held not binding on those not agreeing to it, and the natural inference is that when the court, in determining from the evidence the rights of the individual users, embodies these stipulations, in his decree, they become final in the eyes of the law because not questioned during the progress of the trial. The injustice of such a ruling, however, warrants a doubt if, when once tested, it would not be overthrown and the rights between the parties entering and those not entering the stipulation left again in doubt.

The objections to the settlement of all rights to a stream by stipulation are of a somewhat different nature. At the end of a complicated and protracted water suit, after each side in the suit has reached the limit to which it can go in its testimony, it is quite common for a stampede of stipulations to begin which will perhaps end only when the whole available supply of water has been divided, without regard, perhaps, to much of the testimony that has been introduced in the trial or at any rate without regard to the real duty of water or the rights of appropriators not represented, or of those who may desire a few years later to reclaim some of the desert land lying under the stream in question. The result is very liable to be that the rights of the weakest in defense are considerably reduced from what they would have been had the court, after a careful examination of all the testimony, made a systematic award. It is of course urged in defense of such a stipulation that those making it would not consent to it if their rights were not protected, yet it is a fact that this is not always the case, because it sometimes happens that those whose rights are stipulated are not represented by attorneys. There is on record an order of court emphatically refusing to sanction a decree stipulating away the rights of unrepresented parties "simply because some of them have refused to hire an attorney and pay out four or five times what their water is worth in order to employ them." One farmer shrewder than others may gain water on a lower duty than others, with the same resulting variance in the basis of awards as in the stipulations out of court. The acquiescence of the less shrewd is no excuse for the public failing to protect him.

Although the lack in uniformity resulting from stipulation may be serious, the injury to the public is far more so. To have the appropriators from a public stream divide its water among themselves under sanction of the court has no justification. Under such a practice those taking water from a stream, even if they do not use half its water, may agree to a division of the whole supply among themselves, and in that way acquire title to public property, not from the public and by use, as the law provides, but from each other and by agreement. The stream is the property of the public, and should be carefully conserved in the interests of future appropriators, yet there is on record in the Sevier River cases no action by a court looking to protection of the rights of the public, and it is doubtful if such action is authorized by statute.

The fault of this situation does not lie at the door of the trial courts. The great need is for a properly organized state engineering department with authority to measure the flow of the streams, and the acreage to be irrigated, and also to determine the amount of water needed by the different soils. If when this work were completed the state engineer had authority to make a preliminary order of distribution pending a consideration by the district court, the court would then have time for a careful consideration based upon scientific information gathered by a disinterested public official.

CHAPTER X

SUPREME COURT DECISIONS AND IRRIGATION — RIPARIAN RIGHTS AND APPROPRIATION

In humid regions in English speaking countries, the doctrine of riparian rights has held from time immemorial. It is the doctrine which holds that the owner of the land bordering on a stream is entitled to have it flow on as it has been accustomed to do without any serious interference. That is to say that a land owner bordering upon the stream above may use the water to turn a mill or in other ways produce power provided that he returns the water unreduced in quantity or unpolluted in quality to its original channel before it reaches the land of the riparian owner below. Such a doctrine was entirely unsuited to the arid region, and Colorado specifically abolished it early by legislative enactment.

In all, legislation pertaining to the waters of the territory or of the State of Utah the legislature ignored the law of riparian rights and applied the doctrine of appropriation for beneficial and economical use. The law of riparian rights was never specifically set aside by law in Utah, and strange to say it did not become an issue before the Supreme Court of the territory until 1891. The court then held in Stowel et al, v. Johnson et al, that the law of riparian rights was not in force in

Utah. It further said "that such a doctrine would make this western country a desert. That a man holding ten acres down on the stream could make all the land above useless." (7 Utah 215—; 26 Pac. 290.)

As the doctrine of appropriation has been consistently followed in Utah it will be of interest to know how the highest tribunal in the State defines it.

In Hague v. Nephi Irrigation Company (16 Utah 42; 52 Pac. 765) the court said in 1898: "The appropriation of water does not mean merely the diverting of it, but includes the use of it for beneficial purposes. The appropriation, the intention of appropriator, use and beneficial purpose are the tests which determine the rights acquired by the diversion from the stream. The object and intention, under the law in diverting water must be to apply it to some useful purpose, and if by means of ditches more is diverted than is necessary for such purposes the excess cannot be regarded as a diversion for a useful purpose; for as a matter of fact, such excess merely runs to waste and its diversion cannot result in a vested right. If therefore A who owns and intends to irrigate but one acre of land diverts all the water of a natural stream, which is sufficient to irrigate two acres he obtains a right only to sufficient water to irrigate his own one acre and B. who owns an acre may appropriate the excess. If there is no intention on the part of the appropriator to apply the water to such purpose within a reasonable time, there is no valid appropriation and the water remains subject to appropriation by others. So where there is more diverted than is necessary for the object of the appropriation there can be no intention to apply the excess it remains subject to appropriation." The court here quotes and approves Kinney's "Irrigation," paragraph 150 which says: "This intention goes to the very foundation of the act of appropriation and must be evidenced by a constancy or steadfastness of purpose or labor as is usual with men when engaged in like enterprises who desire a speedy accomplishment of their designs. If we concede that a man has a right by mere priority to take as much water from a running stream as he chooses to be applied to such purposes as he pleases the question still arises what did he choose to take."

In Eliot v. Whitmore et al, 1901 (23 Utah 342; 65 Pac. 70) the question whether or not an appropriator has to use all the water he intends to at once was considered. The court said: "We see no reason why a settler in a new country may not appropriate the waters of an adjacent creek without having the lands he contemplates using the water upon in a condition fit for irrigation at the time of his first diversion of such waters at least until some other settlers complete a successful, necessary and beneficial use of the then unappropriated waters of a creek. He is not confined to an appropriation simply for the amount of land irrigated during the first year of his diversion. The extent of an appropriation of water is determined by the reasonable necessity for the use of the waters by the intention of the appropriator, followed by a reasonable diligence in executing such intent and by beneficial purpose for which the appropriation is made."

In Fuller et al v. Sharpe et al, 1908 (94 Pac. 813) the court said: "That the first in point of time in appropriating said water and constructing said ditches are entitled to the first right in the waters of said stream and so on successively to the last appropriator; that in case the water is insufficient in said stream at any time to fill all of said ditches then those having the junior appropriation shall turn into the natural channel of the stream all of the waters diverted by them until sufficient is turned into said stream to supply the ditches of any prior appropriator in point of time."

In the Settlement of Lehi there were many first settlers, and others came later upon the Mormon bishop's invitation and were taken in the canal system as they began to cultivate land. The ditch was gradually enlarged when cleaned and also at certain other intervals. The new settlers were usually invited by the bishop to help in the cleaning and enlarging the canals. The irrigation canals were looked upon as community enterprises and for over twenty-five years the question of priority did not arise. When water became scarce for the amount of land irrigated some of the older settlers set up priority claims as to the use of water. In 1886 the matter came before the Supreme Court of the territory in Lehi Irrigation Co. v. Moyle et al when the court said: "The appropriator of water has the prior right to its use to the extent in amount and time of first appropriation and possibly to the extent to which he was at that time preparing to appropriate it." In respect to these settlers coming in later the court said: "It was a permission to use the water and the ditch from year to year believing that they had the right to use the same, and upon the strength of this belief and permission to build up homes for themselves. It is now too late for appellant to say that they were acting without right."

In Patterson v. Ryan (37 Utah 410) decided April 27, 1910, the Supreme Court said: "The right to use the water in this state has always depended upon whether the person claiming the water applied it to beneficial use, and the notice and record required by statute was merely prima facie evidence of the facts recited therein, namely that he was applying the water to beneficial use. Any person, however, who actually used the water for a useful or beneficial purpose acquired the right to take the water so used as against all subsequent claimants regardless of whether the user posted notices or not."

Following along the same line in Sawards et al v. Meagler et al, in 1910 (37 Utah 212), the rule was laid down: "In order that the appropriator may be entitled to the use of such water it is not essential that he should have located or taken possession of any tract or parcel of public domain bordering upon the stream or lake from which the appropriation is made or that he even have an interest in or to the lands proposed to be irrigated if such be the beneficial purpose of the appropriator." "He may sell and dispose of the water conducted to others to use it for a beneficial purpose on land claims possessed or owned by them, and in which they have an interest and upon which the water may be used and is applied for beneficial purposes."

PERCOLATING WATERS

In one of the earliest cases on percolating waters, Crescent Mining Co. v. Silver King Mining Co., 1898, the Supreme Court of Utah adhered to the established doctrine applied in the humid regions, that the percolating waters belonged to the owner of the land. A doctrine entirely unsuited to the arid regions was thereby sustained. The court said: "The law seems to be well settled that water percolating through the soil is not and cannot be distinguished from the soil itself. The owner of the soil is entitled to the waters percolating through the soil and such water is not subject to appropriation. When water percolates through and under the surface of the earth upon land belonging to one person and comes to the surface just before it empties itself upon the land of another, the owner of such land has no right to demand that such percolation shall continue. It is held that a person may lawfully dig a well on his own land though thereby he destroys the subterranean undefined percolating water of his neighbor's spring and no action will lie therefore." (17 Utah 444; 54 Pac. 244.)

About 1852 various settlers located in or near the village of Harriman in Salt Lake County. In all there were about thirty-five families who appropriated the waters of Butterfield Creek for the irrigation of farm lands and culinary purposes. The appropriators used the waters continuously from the date of appropriation until 1894 without interference of any sort. Butterfield Creek was supplied by springs rising in the mountains. About 1890 tunnels were dug in the mountains by the Butterfield Mining Company for mining purposes specifically and not for the purpose of securing water. From indisputable evidence it was established that upon the construction of the tunnels that numerous springs which had fed Butterfield Creek and its tributaries large quantities of water for forty years immediately ceased to flow. It was also established that these springs were not the outlet of any subsurface water course or stream having any defined channel connecting them with any body of water.

To a considerable extent the welfare of this village established in the early settlement of the territory was dependent upon the determination of the court as to whether a mining company seeking minerals could tap these supplies of percolating waters, divert them from their natural outlets and sell the water thus obtained or use it upon other lands. The Supreme Court held "Such water so hidden in the bowels of the earth belongs to the owner of the soil and he has the right to dig for it upon his own and appropriate it and use it if he chooses to do so; and if it thereby is a loss to his neighbor it is dammum absque injuria. Water standing on the land underneath the surface or into it by filtration, percolation chemical attraction or in undefined and unknown streams is such an advantage which the owner of the land is left to enjoy." (25 Utah 96; 69 Pac. 719.)

Investigation showed that in reality one-half of the water flowing from the tunnel was due to the diversion of the waters from the springs. This decision was rendered in 1894 and if it was to stand as the fixed law of the state it would obviously endanger the permanent welfare of many of the towns and villages of the commonwealth. Especially would this be the case where mining is contiguous with agriculture.

In many cases, all that was necessary to destroy the economic prosperity of a community was to drive a tunnel in search of ores parallel to its water supply and the value of its farm lands would disappear. Whatever may be said of such a doctrine in the humid regions it obviously had no basis in science or equity or permanent community development in arid lands.

The question of percolating waters did not come before the court again until 1912, a period of 18 years had intervened, and statehood had come to the former territory of Utah. During territorial days it had been, generally speaking, the custom to appoint Eastern men to the bench as a reward of political service. Under statehood the judges are elected. The men elected had formerly served on the bench of the territorial courts but had by this time been in the West long enough to know many of its problems first handed and to question the principles of law held in the East pertaining to percolating waters when applied to conditions wholly different from those under which they had been developed.

In Garns v. Rollins 1912, the court said: "The general trend, however, of recent decisions in many of the states of the Union is away from the English rule or common law doctrine of unqualified and absolute right of a landowner to intercept and draw from his land the percolating waters therein. In later cases the right of the landowner to subterranean waters percolating through his own and his neighbors' lands and which is a common source of supply for the lands is limited to a reasonable and beneficial use of the waters upon the land or to some other useful purpose connected with its occupation and enjoyment. No surface owner possesses the right to extract the subterranean water in excess of reasonable and beneficial use upon the land from which it is extracted." The court, no doubt, had in mind and followed to a great extent the epoch making California case of Katz v. Walkinshaw. This virtually abrogated the old English doctrine in respect to percolating water, and laid down the doctrine of reasonable use. In fact it is almost a complete reversal of the former principles laid down in Harriman Irrigation Co. v. Keel et al where it was held that "hidden water in the bowels of the earth belonged to the owner of the soil," to use it as he chooses to do so "without restriction."

In 1915 the question of percolating waters was again brought before the court in the case of Mountain Lake Mining Company v. Midway Irrigation Company. (149 Pac. 929.) The mining company had driven a tunnel into the mountains parallel to Snake Creek a stream that had been used for irrigation for 25 years. The tunnel tapped the underground and percolating waters and greatly reduced the flow of the creek. As the water emptied from the tunnel the officials of the irrigation company diverted it back into the stream under the claim that the mining company had not developed any new waters but had only intercepted the percolating waters which fed the springs supplying the Snake Creek. The mining company maintained that they were percolating waters and therefore belonged to them as owners of the soil. The Supreme Court said, "It is a well recognized rule of law in this arid region that whereas in the case at bar a party goes upon a stream the waters of which have been appropriated and put to a beneficial use by others and drives a tunnel into the mountain or watershed drained by the stream and immediately under or in close proximity to the stream collects water which he claims to be developed water he must make satisfactory proof that such water is developed. In such cases it is immaterial whether the water when encountered is well defined subterranean channels or percolating through the soil, gravel, fissures and crevices of the rock. In either event the presumption is until overcome by satisfactory proof that the water is tributary to the main stream and the right to it is vested in the prior appropriators of the stream."

In December 1917, the court said in Bastion v. Nebeker (163 Pac. 1092): "It is settled in the jurisdiction that where a party goes upon a stream and at or near its source, the waters of which have been appropriated and are being used by others for beneficial purposes and intercepts or taps a subterranean flow or body and he claims it to be developed water the burden is upon him to show by satisfactory proof that the intercepted and diverted is developed water."

These last two cases cited would appear to have settled the law of percolating waters as far as Utah is concerned and finally to have settled them right. If new water is developed by tunnels being driven into the mountains the men driving the tunnels are entitled to the additional water, but if they have not developed new water but merely intercepted percolating waters to the injury of those who have already applied them to beneficial use they are not entitled to them. The case of the Deseret Irrigation Co. v. Butterfield Mining Co. was not based on science or justice but on legal tradition and if it had not been reversed it would have resulted in ruination to many communities as mining development proceeded in a state that offers a fruitful field for mining operations.

PLACE AND EXTENT OF USE

Many users of water have the idea that they can use appropriated waters anywhere they may want to. The Supreme Court in the case of Becker v. Marble Creek Irrigation Company says: "The waters of a prior appropriator are fixed by the extent of his appropriation for beneficial use and others may subsequently appropriate any water of a stream not used by a prior appropriator, and such later appropriation becomes a vested right and entitled to as much protection as the former and a right of which he cannot be deprived except by voluntary alienation, or forfeiture by abandonment. The rights of the former being thus fixed, he cannot enlarge his right to the detriment of the latter by increasing his demands or by extending his use to other lands, even if used for beneficial purposes."

DAVIS & WEBER

	Year of Appropriation	
Riverdale Bench Canal	1866	18.67 second feet.
Hooper	1867	115 second feet.
Wilson	1870	90 second feet.

(Diagram illustrating the principle involved in Manning et al v. Fife et al.)

In Manning et al v. Fife et al the Riverdale Bench Canal holding the oldest right of the four canals involved shut down for five days, August 1, 1897, with the understanding that the water should go to the Davis and Weber Canal Company. The lands under the Riverdale Bench Canal, amounting to five hundred acres were sufficiently irrigated when the water was turned out of the canal and into the Davis and Weber Canal. The shutting out of the water did not in any way impair the crops under the Riverdale Bench Canal, whereas the diversion of the water did seriously injure the crops under the Hooper and the Wilson canals due to the shortage of water. The Riverdale Bench Canal Company claimed that it had the right to close its gates and to allow the Davis and Weber Canal Company to divert or to loan the use of the water to the amount of 18.67 second feet to the canal above. The plaintiffs claim a prior right as against the Davis and Weber Canals and contend that they are entitled so far as their beneficial needs extend to all the water not actually used by the Riverdale Bench Company. The court said: "Does an appropriator of water from a natural source of supply, when there are subsequent appropriators who used the water and actually have less than the quantity they appropriated, have the right to divert it to uses other than those for which it was appropriated by giving it away or wasting it? The right to the use of water for any useful purpose is deemed to have vested as a primary right to the reasonable necessity for such use. The right only vests to the extent of the necessity for such use. The nominal appropriation as to quantity may be sufficient to afford enough at times when the most water is needed and to that limit the appropriator may draw when necessity requires; but when less than nominal or maximum quantity is needed the difference must go to subsequent appropriators to be taken by them in the order of their appropriation and if he takes more into his canal than the purposes of his appropriation require, Section 2785

Comp. Laws of Utah 1888 requires him to convey the surplus again to the natural channel or source for the use of subsequent appropriators." In Becker v. Marble Creek Irrigation Company the court referring to the appropriator, said: "Cannot give away or dispose of his surplus water to the injury of subsequent appropriators." The court properly held in the Riverdale Bench Canal Company that it could not give the water to the Davis and Weber Canal Company as against the claims of the Hooper and the Wilson Canals.

CHANGE OF USE

It occasionally happens that an appropriator appropriates water for use such as for power purposes and then desires to use it for agriculture, supplying the power by electricity. In Big Cottonwood Tanner Ditch Company v. Shurtliff, the Court said: "Moreover, the claimant may not appropriate the water for one purpose and then apply it, or any part of it for another purpose."

OWNERSHIP OF WATER

It is a common but fallacious opinion of many appropriators of water that they own the water. The facts are that they have a right of usage whereas the ownership rests with the public or the State. In a practical way, for the user who makes an economical and beneficial use of the water it does not matter as to the theory. To the State and to the wasteful user of water it does matter for if the State owns the water it can compel an economical use. In Salt Lake City v. Salt Lake City Water and Electrical Power Company (25 Utah 456; 71 Pac. 1069), the court said: "Neither in common law nor under the law of appropriation does the appropriator own the water."

INTENTION AND TIME IN APPROPRIATION

In the appropriation of water, intention goes to the very foundation. If it is not intended to put the water to some beneficial use there is no appropriation. In the case of Hague v. Nephi Irrigation Company the court says: "No matter how much water may have been diverted, the quantity necessary for the purposes for which the appropriation is made and the intention to apply it without unnecessary delay may also appear in order to confer upon the appropriator a vested right thereto. If there is no intention on the part of the appropriator to apply the water to such purpose and within reasonable time, there is no valid appropriation and the water remains subject to appropriation by others. So where there is more diverted than is necessary for the object of the appropriation there can be no intention to apply the excess to a useful purpose and such excess remains subject to appropriation." (16 Utah 421.)

In Kinney's "Irrigation," paragraph 50 it is said: "The intention goes to the very foundation of the act of appropriation and must be evidenced by a constancy or steadfastness of purpose or labor as is usual with men engaged in like enterprises who desire a speedy accomplishment of their designs. If we concede that a man has a right by mere priority to take as much water from a running stream as he chooses to be applied to such purposes as he pleases the question still arises what did he choose to take."

ENLARGING CANALS

In Tanner v. Provo Bench Canal and Irrigation Company, 1911 (121 Pac. 584), Tanner desired to enlarge the Provo Bench Canal to convey water he had filed upon to the land he desired to apply it to. The irrigation company refused to grant him the right to enlarge its canal. He claimed the right under the law. The case was carried to the Supreme Court of the United States. From the lowest court to the highest court Tanner's contention was sustained and he was permitted at his own expense to enlarge the canal to carry the additional water.

METHOD OF APPLICATION OF WATER

In Nephi Irrigation Company v. Vickers, 1905, the district court of Juab County, the trial court, allowed Vickers one-fourth of a second foot continuous flow to irrigate thirty acres. An appeal was taken to the Supreme Court on the ground that the volume of water awarded for the land to be irrigated would be valueless unless the ground was furrowed. The Supreme Court granted Vickers eight-tenths of a second foot for ten days each month. The court said: "As appears from the proof the appellant applied the water in an ordinary and usual way, and he was not bound to furrow his land before irrigation. So long as he uses the water without waste and in accordance with his appropriation no one has a right to complain and under such circumstances a court cannot change his manner." (29 Utah 205; 81 Pac. 144.)

POINT OF DIVERSION

In the arid West even where the doctrine of appropriation is accepted the question of the point of diversion is often raised. A canal was built in the early days of settlement with an intake low down on the stream. For many reasons, principally the bringing of additional land under irrigation, it is often desirable to change the point of diversion. In the meantime perhaps the natural flow of the stream has been used for power purposes and the proposed change of the point of diversion would seriously interfere with the use of the stream for power purposes. In Hague v. Nephi Irrigation Company, April 1, 1898, the court said: "Upon examination, however, it will be found that they all support the doctrine above stated that one who is entitled to the use of water or a stream may change the place of diversion if the rights of subsequent appropriators are not affected by the change." (25 Utah 456.)

In Salt Lake City v. Salt Lake City Water and Electrical Power Company, April 1, 1903, it was decided that a power company did have a right to change. "Manufacturing enterprises are entitled to a secondary right of use for power purposes if it does not work to the injury of the original appropriators." (52 Pac. 759.)

In the Hague v. Nephi Irrigation the point at issue was whether the canal company could change the point of diversion up the stream to irrigate more land when by so doing it prevented the use of the water for power purposes in the operation of a flouring mill. The decision prohibited the change to the injury of the mill.

BENEFICIAL AND ECONOMIC USE

There is a general idea among many irrigators that they have a right to use as much water as they see fit upon their land provided they have used a like amount for many years. Some even go so far as to contend that they own the water and are strictly within their rights if they restrict themselves to the amount appropriated at an earlier date regardless of the number of acre feet they use upon their land or the value of the water for crop production even if through such methods large areas remain entirely without water, due to needless extravagance. There are sections in the State where as high as eight acre-feet are used where three would serve the agricultural needs much better and conserve the fertility of the soil far greater. It is impossible for many to comprehend that ownership and use of water is a state problem and that the irrigator is entitled to and should be protected by law in the use of a reasonable amount of water for crop production. The supreme court of the state has considered the question of the duty of water in a number of cases. In Becker v. Marble Creek Irrigation Company the court said: "In the arid regions water is life and it is too precious an article to be permitted to run to waste. The great weight of modern authority is to the effect that when an appropriator permits part of the water appropriated to run to waste, or fails to use a certain proportion of it for some beneficial use, and his right is limited to the portion of it for some beneficial use or purpose, he can only hold that part of the water which has been actually applied to a beneficial use and his right is limited to the quantity used. The awarding of a priority in excess of the amount actually appropriated for a beneficial use at the time is an error."

The above case does not touch on the economical use of irrigation water beyond restricting waste water which in common use is the water allowed to flow off of the land into some channel where it has no value whatever.

In the case of Hague v. Irrigation Company, March 16, 1898 (16 Utah 421) in speaking of the amount of water that an appropriator may use the court said: "If therefore a user who owns and intends to irrigate but one acre of land, diverts all the water of a natural stream which is sufficient to irrigate two acres he obtains a right to sufficient water to irrigate his one acre and, B. who owns an acre may appropriate the excess. If in this arid region the law were otherwise it would be a menace to the best interests of the State as well as to its citizens because it would enable a few individuals or associations of individuals by diversion of water in excess of use to greatly limit the area of the public domain which could be cultivated. No extravagance in the use of water was ever intended by the enactment of the laws relating to the appropriation and use of water in the arid belt of the country. The extent of the appropriation is limited, no matter how much water may have been diverted, to the quantity necessary for the purposes for which the appropriation is made and the intention to apply it to some useful purposes."

In Fuller et al v. Sharpe et al, 1908 (94 Pac. 813), the Supreme Court said: "It is the settled policy in this state, and that of the entire arid region as well, to compel an economical use of the waters of the public streams and other natural resources." The Utah court approving the Danberg case, 81 Fed. 119, says: "There must be beneficial use before any protection can be invoked. In the appropriation of water there cannot be any dog in the manger business by either party to interfere with the rights of others, when no beneficial use is or can be made by the party causing such interference."

In the "Big Cottonwood Tanner Ditch Company v. Shurtliff, Dec. 27, 1916, the court stated: "It has become an elementary doctrine in arid regions that no one is entitled to a greater quantity of water for any particular purpose than is reasonably necessary to supply the needs of the claimant for the specified purpose. It is true regardless of the quantity of the water that has been used for such purpose and the length of time it may have been used." (164 Pac. 856.)

The Utah Supreme Court quotes and adopts the Oregon case known as the Little Walla Walla Irrigation Union v. Finis Irrigation Company, where the Oregon Supreme Court says: "The actual amount of water needed for the use to which it is applied is the limit to which a party is entitled to water for irrigation, regardless of the fact that he may have actually diverted more water for a long period of time. He (the claimant) will be restricted to the quantity of water needed for the purpose of irrigation for watering his stock and for domestic use. No person can by virtue of his appropriation acquire a right to any more water than is necessary for the purpose of his appropriation." The Utah Court said: "The courts also have the power to prevent a claimant from wasting water and within limits may prevent waste through the means or channels that the claimant uses for diverting and taking water from the main stream to the place of use."

The Utah Court also cites and adopts the ruling of Colorado. In Town of Sterling v. Pawnee D. E. Company where the Colorado Court says: "The Law contemplates an economical use of water. It will not countenance the diversion of a volume from a stream which by reason of the loss resulting from the appliances used to convey it is many times that which is actually consumed at the point where it is utilized. Water is too valuable to be wasted either through an extravagant application for the purpose appropriated or by waste resulting from the means employed to carry it to the place of use, which can be avoided by the exercise of a reasonable degree of care to prevent unnecessary loss or loss of a volume which is greatly disproportionate to that actually consumed. An appropriator must therefore exercise a reasonable degree of care to prevent waste through seepage and evaporation in conveying it to the point where it is used."

Going still farther east, the Utah Supreme Court cites and adopts the ruling of the Nebraska Supreme Court in Courthouse Rock Irrigation Company v. Villard, where it says: "It is an essential purpose of our irrigation laws to require an economical use of waters of the State. The plaintiffs have an adjudicated right to the use of 30½ cubic feet of water to a second, of the waters of Pumpkin Seed Creek, so far as they beneficially use the same; but they are not permitted to take water from the stream which they cannot use or what amounts to the same thing they are not entitled to wastefully divert water into a canal which otherwise might serve a good purpose if used by appropriators or riparian owners whose priorities are inferior or subsequent to the right of the plaintiff." (75 Nebraska 411.)

In the case of the Big Cottonwood Tanner Ditch v. Shurtliff, in addition to his claim to water to irrigate his farm lands the defendant claimed the right to use one-half of a second foot of water for culinary purposes and to convey the same as he had done for 19 years in an open ditch with a gravelly foundation when a competent engineer from measurements established that seventy-five per cent. of the water was lost through seepage. The court concluding the case said: " Neither may they waste water either by supplying more than is reasonably necessary to supply their needs for the purposes aforesaid." Here the court held that some more economical means than an open gravelly ditch would have to be provided to convey the water to the house.

CHAPTER XI

THIRTY-EIGHT YEARS OF IRRIGATION LEGISLATION

1880–1918

With the exception of some few minor amendments to the then existing laws, there was no water legislation from 1880 to 1897. There was much legal doubt as to whether the Congressional Act creating the territory authorized the exercise of what appeared to many as judicial power, in reference to water rights, by the county courts. This left the work done by these bodies always in doubt. Much of it considering the irrigation knowledge then extant was splendid and far beyond the period. Yet it was not carried on as it probably would have been if that fear had not existed. Nevertheless the law remained unaltered and so far as the writer can discover it was never carried into the courts for a legal determination of its validity. The outcome was that the law of 1880 continued in operation in some counties until statehood.

The constitution of the new state ignored the whole question of water rights, or the settlement of them except the reference made in Article 17 Section 1 where it provides: that "All existing rights to the use of any waters in this state for any useful or beneficial purpose are hereby recognized and confirmed." Such a meagre provision neither added to nor detracted from the conditions already existing and its brevity and indefiniteness were due probably to a lack of unanimity of opinion in the constitutional convention and a realization by that body that nothing more was possible.

In 1897 two laws were passed dealing with irrigation and water rights. The first dealt with the practices of irrigation and water rights and their acquirement and the other with the creation of the office of State Engineer and its duties. With minor changes the first law simply followed, as far as the use and appropriation of water were concerned, the provisions already in force. They were, in the main, an embodiment of the practices which had grown up in the territory. In brief they were customs enacted into laws.

The old laws, already considered, empowered the county court and later the county selectmen to divide and apportion the waters of the various streams and the other sources and also to adjudicate and settle disputes arising among the several appropriators of the streams. Notwithstanding the doubts cast upon the legality of this provision it worked splendidly. It is admitted that the work was not accurately done but neither was the available data scientific. During the time of their operation and with the facilities at hand perhaps no other body could have done as well or better. At all events hundreds of streams were divided and thousands of water rights were determined so accurately that up to the present time these decrees have not been disturbed. Moreover it was an expeditious and inexpensive method, where the deciding body itself could visit the stream and the land, the users could appear and state their case, and the necessary testimony could be introduced without the expenses of legal assistance.

In the early history of the territory, the canals seldom extended beyond the boundaries of a county but as time passed larger and longer canals were built and some modification in irrigation law became necessary. The greatest necessity was some united control or central authority for the whole territory. The logical thing to have done, under such a necessity, inasmuch as the old system had worked so well in limited fields, would have been to have created a single board with state wide jurisdiction similar in authority to the old county court. Instead of pursuing the policy of centralization and appropriating the rich experience of the county courts the whole problem of determining and adjudicating water rights was turned over to the civil courts. The courts could not on their own initiative proceed to determine the water rights within their several districts. They had to wait until some one filed a complaint with the court to the effect that his rights were being infringed upon and then brought a suit to determine the rights at issue. At the discretion of the courts all the appropriators from the source in question could be cited to appear. The court, however, had only such information in regards to the facts as was brought before it by the litigants and was well within its rights in determining only the issue before it. This left the whole future use of the waters of the stream open to litigation, as soon as some user of water, not involved in the previous litigation, desired to enter a suit. Moreover the court did not have before it a body of carefully prepared scientific data and often awarded to the claimants many times the amount of water needed for economical, beneficial irrigation or even many times the average flow of the stream.

The proper apportionment and distribution of irrigation water is more a question of irrigation engineering and soil physics than it is of law. By this it is not meant that law is not essential, but if engineering and soil data are properly done it needs only the simplest application of rules of law by an administrative board and litigation would almost entirely disappear. At present in the adjudication of water disputes the court has to depend upon the testimony of the users which in the main is inaccurate and self interested or upon the testimony of partisan employed engineers. Many capable exponents of irrigation reform have maintained that the courts dealing with litigation should have attached to them an irrigation engineer to make independent investigation for the court.

From the early settlement of the territory until 1880, the streams, lakes, and other water sources were regarded as public property. The authority controlling the waters had exercised the right to grant or deny the applicant the use of the water applied for. Naturally in case of a denial the reasons for such a decision must be assigned. The right of an appeal against the arbitrary exercise of this authority always lays to the courts. With the adoption of the State Constitution and the laws enacted immediately following statehood the water rights became free for all and the right of use became merely a question of actual appropriation among the several appropriators. The State was silent on the whole matter. In case of dispute the state did not interpose to protect the public waters but simply opened the courts to decide disputes as between individuals. The State did not intervene to protect the rights of the public, or to protest against excessive or unreasonable grants. Few of the judges knew much about irrigation and the law was not as well developed then as it is now. Consequently the district courts frequently granted many times as much water as was essential to crop production. In fact so much was frequently granted as to be injurious to soil fertility. In order to secure even such unsatisfactory adjudications it was necessary to employ attorneys and to enter into expensive litigation. In most instances the courts merely apportioned the whole stream to the various claimants.

If the new State had assumed control over every source of water supply under a more centralized organization, and, acting upon the experience of the past it had investigated to see that petitions for water were to meet an economic and beneficial use, few excessive grants would have been made and new users, if the streams had been properly measured as was required by the law of 1880, could have found upon application to the central office whether there was any unappropriated water in a given stream. Moreover, in too many instances the court had no sooner settled one case than another involving the same stream and nearly the same parties was begun because one or more users of the stream had not been made a party to the former suit, and the State appeared to have no interest in the issue. It was a distinct loss to the State that the old system had not been developed to meet the new needs instead of turning to another system nearly as decentralized and even less competent than the old one.

The fact stands out that unlegal as they were generally held to be, that the vast majority of all adjusted water rights in the state is the work of the early county courts and the board of county selectmen. The work in many instances was crude, due in the main to the impossibility of obtaining accurate data. It is over twenty years since the new system came into operation. Most of the cases it has decided are a reaffirmation of the old adjudication but in the main very few of the old settlements have been disturbed or even questioned which is strong evidence that the old system did good work or that the new system is very inefficient.

As already indicated in a previous chapter, the law of 1880 made water rights personal property at the discretion of the holder. The principle was continued by the law of 1897 and is part of the present water statutes of the State.

The law providing for the organization of irrigation districts was repealed and a new one was not re-enacted until 1909.

A second law passed at this session (1897) created the office of State Engineer. It was maintained at the time that the law was passed primarily to aid in the adjudication of water rights. If that was its purpose it has signally failed. From such a statement it must not be assumed that it has not made an honest effort but failure is due primarily to the legally prescribed methods which have proved ineffective.

The law defined the duties of the State Engineer as follows: "To examine into and report upon reservoir sites for the state under the direction of the state board of land commissioners; to submit plans, specifications and estimates for the construction of reservoirs, dams and canals at the request of the board; to supervise any state reservoir; and to pass upon the character and sufficiency of all other irrigation works that the State has an interest in."

In addition to the foregoing, the state engineer was to keep a full and complete record of all measurements of streams, but the peculiar part of this is that the law did not authorize him to make any such measurements. Individuals or companies undertaking to construct reservoirs or dams except where the dams were less than ten feet in height were required to secure his approval. The plans and specifications were to be submitted to him for approval before the work was begun. Moreover as the work progressed the State Engineer was required to inspect the structure for safety. When he regarded it as unsafe he was required to report the actual condition to the district court and ask for an order condemning it. Such procedure usually meant a hearing with its attendant delays. At best it was a cumbersome process to be resorted to only in extreme cases.

If the law creating the office of State Engineer is looked upon as a beginning, even with its small grant of powers, it was a step in advance. The very creation of the office of a state engineer is a recognition of the necessity of some central authority, to control the waters of the State. The salary was fixed at one thousand dollars a year and was small to obtain the full time of a competent engineer. Excellent men were, however, found to serve even at such low pay.

In 1901 a new irrigation law was passed. It granted essentially increased powers to the State Engineer. It gave him general supervision of the waters of the State and the officers connected with its distribution. He was now authorized to measure the streams of the state and to make surveys and collect data upon all possible irrigation canals and reservoirs. When the measurements of a stream were made it was required that at the same time they were to include the carrying capacity of all canals diverting water from the stream. The lands irrigated from the canals were likewise to be measured. A map of the stream and diverting canals was to be made and kept on file in the office of the State Engineer. At the same time a copy was to be filed with the county recorder.

The county commissioners were directed to create one or more water districts out of each county, and to appoint a water commissioner for each district. The duties of these water commissioners were to measure and to divide the natural streams among the canals according to the prior rights of the users and also to employ all necessary steps to conserve as far as possible the natural supply of water. In the performance of their duties the water commissioners were subject to the control and direction of the State Engineer. These water commissioners where they were appointed found their chief duties in adjusting water difficulties among the different canals drawing water from the same natural stream in the summer season when the water was scarce. There was no other legal authority outside of the courts to adjust these petty difficulties.

In the main the provision for the appointment of water commissioners did little good. The appointments were left to the option of the County Commissioners and except when difficulties arose no appointments were made. The chief motive for a refusal to appoint was to avoid the salary expense to the county and later to the water users. When they were appointed there was little to guide them. The fact that there were disputes was evidence that there had been no adjudications of record and consequently not much for these men to go by. The commissioner's chief function was that of a peace maker.

The law of 1903, with the addition of a few new features, was a codification of the existing laws.

The law of 1903 divides itself under three main heads. (a) General Provisions. (b) Duty and authority of the State Engineer. (c) Adjudication of water rights.

First, (a) the state constitution was silent as to the ownership of the waters of the state. The law of 1903 in section 47 says: " The water of all streams and other sources in this state, whether flowing above or under the ground in known or defined channels is hereby declared to be the property of the public, subject to all existing rights to the use thereof." An interpretation has not yet been given this section by the court. Inasmuch, however, as the courts make a distinction between, " the property of the public " and " the property of the State," the former being interpreted merely as giving the State control while the latter means State ownership, it would have been better to have employed the latter term and to have made it explicit that the State did really own the waters.

The other general provisions included the acquirement of rights by appropriation, a requirement that new appropriators should apply to the State Engineer for permission to appropriate, publication of notice of appropriation with stream and location, priority of appropriation to be the rule of use, right of the owner to declare water personal property, water rights to be transferred by deed, etc. Dams holding over ten feet of water were subject to inspection by the State Engineer.

The second division (b) dealt with the appointment of the State Engineer and defined his powers and duties. The State engineer was appointed by the Governor for a term of four years. The salary was fixed at 3000 dollars and the appointee was to possess a theoretical and practical knowledge of irrigation engineering. The new law gave him considerable power. He was to possess general supervision over the public waters of the state, their measurements, apportionments and appropriation. He was empowered to make the necessary rules and regulations pertaining to the same; to carry out the above requirements he was, if not already familiar with the irrigation needs of the state, to become acquainted with them.

Perhaps the most important power granted and duty imposed was that he was required to make a complete hydrographic survey of each river system and water source of the State, beginning with the streams and source most in use. The data collected by these surveys was to be assembled to aid in establishing and determining the rights of the several water users throughout the State.

The unappropriated waters were to remain under his supervision until they were appropriated according to the provisions of the law. Application for the unused waters of the State were to be made to the State Engineer, but before he could deny or approve an application he must advertise for thirty days in some newspaper having general circulation within the river system or water source where the proposed appropriation was to be made. Protests can be filed against such a grant. When all the evidence is before the engineer he can grant or deny the application. If the applicant is not satisfied he can apply to the courts. The act carried provisions covering the granting of an appeal to the courts from nearly every power granted the engineer.

The State was to be divided into water divisions by the State Engineer and over each division with the approval of the governor he was to appoint a superintendent. The districts were to be further subdivided into subdivisions. Over each subdivision, with the approval of the State Engineer, the superintendents of the district were to enforce the State water laws and regulations and to exercise control over the supervisors. The supervisors were required to divide the water among the several canals from the natural streams and to distribute the flow among the users from the canals. The superintendents were to be paid by the State and the supervisors by the counties or users.

Thirdly (c), as already pointed out the granting or the denying of water rights, the dividing and distribution of the water and the settling of disputes rising among users until 1897 were powers exercised by the county courts and county selectmen. So far as divided authority could go and the unscientific data permitted the work was fairly well done. At all events the policies and practices pursued were among the best evolved up to that date. As the territory grew isolated settlements using only part of the available water supply became thriving towns needing all of the supply. The people began to build reservoirs and construct canals that not only supplied several towns but more than one county. The local problem first became a county problem and then a State problem. The logical thing to have evolved from the town and the county board of water control was a state board of water control. Instead of evolving such a natural system, along the lines already begun a resort was had to the old cumbersome, unworkable court system which had not and has not accomplished anything worth speaking about in Utah.

The law of 1903 tried to employ the two ideas, the employment of the State Engineer and his office to collect data and measure and control the streams and the district courts to adjudicate the water rights. The law required the State Engineer, as already indicated, to make a hyrographic survey of the streams and water source of the State. In addition to measuring the flow of the water he was to collect all other data that would assist in determining the existing rights together with the rights of the several canals and the names of the users of the water and the acreage to which it applied. Correct maps showing the canals, streams, etc., were to be prepared. When all the information obtainable was collected the State Engineer was required to file it with the Clerk of the District Court of the county in which the stream is located. When the data is complete so far as the Engineer's office can make it, "the court has exclusive jurisdiction in the determination of all water rights on the stream or other source." The State Engineer can go no farther and must abide the pleasure of the court.

When the information is filed with the Clerk of the court it becomes his duty to file it in proper books and to notify by registered letter all the users whose names are found in the Engineer's report. In order to protect the rights of users who may be overlooked in the investigation the clerk is required to give public notice through some newspaper having general circulation in that locality, so that they can file their claims before an adjudication is made by the court. If the court acts, but it usually ignores the whole matter, it is authorized to take testimony in order to reach a decision, disregarding at its pleasure, the data collected by the office of the State Engineer. In simple terms the law requires the State Engineer to make the necessary hydrographic surveys, collect all the available data, place all the information before the court and then allows the court at its pleasure to ignore the whole effort and to leave the water situation as it was before the State Engineer made an investigation. Nothing has been accomplished with this hybrid law and probably nothing will be.

With the general fear that the work done prior to statehood, owing to the failure to grant proper power by the territorial organic act to the county courts, will not stand the constitutional test few in the state know exactly the status of their water rights. Thousands of dollars have been spent by the State for making water rights investigation and the data is growing valueless with age. The water users who have had their water rights determined are those who have had either to prosecute or to defend them in court. These decrees in many cases, due to lack of scientific information, are often very faulty.

Since 1903 there have been a number of minor amendments to the water legislation of the state but nothing fundamental or of major importance.

This situation is not due in any way to the neglect of the men who have occupied the position of State Engineer. Four years after statehood (1900) Robert C. Gemmell called the attention of the legislators to the existing condition and advocated the adoption of the Wyoming plan which had been in operation in that State for ten years. In fact, he went so far as to draw a law for presentation to the legislature but nothing came of it. The following is a general outline of his bill which has been endorsed and supported in general by most of the State Engineers. This is especially true of State Engineer Caleb Tanner in the seventh biennial report:

a. State Engineer shall be the one office of water record for the whole state and users of water shall be compelled to record their rights.

b. All persons or corporations desiring to appropriate water shall be required to secure a permit from the Board of Control.

c. All county records shall be transferred to it.

d. The State shall be divided into four water districts and a superintendent appointed to each district to regulate the water in the district, subject to appeal to the State Engineer and Board of Control.

e. State Engineer and district superintendents constitute a state board of water control with authority to adjudicate the rights to all the public waters of the

State, a right of appeal to lie from the board of water control to the courts.

f. The State Board to make hydrographic surveys and measurements of all streams and sources of water, also of land irrigated by same before adjudicating water rights upon it.

g. Board of water control to divide districts into subdivisions.

h. All appropriations of water for reservoir purposes to be filed in the office of State Engineer.

BEAR RIVER
VAL
IRRIGATION
LAKE

CHAPTER XII

THE BEAR RIVER CANAL

Forty years ago Bear River Valley was a sage brush flat utilized principally for the grazing of cattle and sheep and as a wild run for jack rabbits. To-day it is one of the richest and most fertile agricultural regions in the great West. The valley itself is located in the extreme northern part of the State of Utah and comprises an area of about 150,000 acres. It is in fact the northern end of the Great Salt Lake Valley and lies west of the southern part of Cache Valley. The two valleys are separated by a low divide of the Wasatch Range of mountains. Through this divide known as the Cache divide, Bear River has cut a deep narrow gorge through which it flows. The bottom of the gorge is very rough and rocky. As Bear River Valley is considerably lower than Cache Valley the west end of the gorge is considerably lower than the east end and the flow of Bear River over its rough bed, for a distance of about six miles, is one of rapids and water falls.

From the standpoint of a solid foundation and rapid flow of the stream, Bear River, at this particular place, offered good opportunities for diversion dams. The sides of the canyon or gorge, however, are very rough, being composed largely of solid ledges of lime stone. Most of the soil has been washed away leaving the bare rocks. From the nature of the formation the building of canals through the canyon is a difficult piece of work. In order to raise the water to the proper elevation for irrigation in Bear River Valley the diversion dam was built in Cache Valley. Two canals, one on each side of the river, were built through the canyon. It was necessary in order to keep the water high enough to build the canals well up on the sides of the canyon. In many places tunnels for the canals were blasted through the lime stone ledges. For a large part of the distance the canals were of masonry construction, there not being sufficient soil with which to build them. The whole undertaking was an expensive piece of work, and wholly beyond the financial ability of a coöperative body of poor farmers. If, however, the lands in the Bear River Valley were to be reclaimed this was the only source of water supply available. The first survey of the project was made in 1868 but the undertaking proved of such magnitude that the promoters realized the impossibility of their undertaking and petitioned the Congress of the United States for assistance to carry it through. The petition was denied. At that time the thought of the Federal Government aiding in the reclamation of Western arid lands either by grants of money or grants of land was distant from the mind of Congress. The idea of withdrawing public lands from entry and making them subject to a lien for water as is done in the Carey Act in order to protect the investor and builder of canals from speculative land entrymen had not been considered.

As a bonus to encourage the construction of the Union Pacific and the Central Pacific Railroads, the United States Congress granted to them the alternate sections of public lands for twenty miles on each side of the roads. The two roads met at Corinne in the Bear River Valley and therefore each owned part of the lands of the valley. Corinne, however, was an unsatisfactory place for the meeting of the two great roads so the Central Pacific purchased the short piece of road from Ogden to Corinne and thereafter Ogden became the junction of the two systems. This gave the Central Pacific railroad the ownership of all the railroad lands of Bear River Valley. In 1883 railroad lands in the valley amounting to 45,000 acres were purchased by the Corinne Mill Canal and Stock Company for a sheep run. The leaders of the corporation saw the possibilities of the country under irrigation and had surveys made with a view of bringing out the waters of Bear River. The plan was to erect a diversion dam in the bed of the stream in Bear River Canyon. The rocks in some parts of the river bed in the canyon stood high and it was thought that these could be employed in the construction of an inexpensive dam to divert the water into a canal and also to provide power for an electric power plant. It was, however, soon realized that the project was too much for the financial resources of the Corinne Mill Canal and Stock Company and the officers of the company began to look about for some means of financing the prospect. About this time John R. Bothwell, a promoter, appeared on the scene. He took a trip over the valley, saw the land and inspected the source of water supply and became convinced that the project was feasible and would be profitable. His plan was to consolidate the land owned by the Corinne Mill and Canal Stock Company and the proposed irrigation system into one company and to sell the land and water together under one contract. The company offered Mr. Bothwell one-half of the proceeds of the sale of the lands if he could finance and construct the canal system. Over twenty years had elapsed since the petition was sent to Congress until the coming of Bothwell and nothing had been accomplished. But now success and disaster was to follow each other in rapid succession. So disastrous was the venture for those who furnished the capital that the writer hesitates to chronicle the story. It is pathetic that a brilliant and successful engineering project and, of recent years, an unsurpassed agricultural and homemaking venture should have meant a complete loss to the poor men and women in Great Britain who furnished the capital.

John R. Bothwell succeeded in interesting the Jarvis-Conklin Mortgage and Trust Company of Kansas City to underwrite and finance the new company. He entered into the following contract with the Mortgage Trust Company:

CONTRACT

JUNE 19, 1889.

Contract entered into between the Jarvis-Conklin Mortgage and Trust Company of the first part, and John R. Bothwell of the second part.

The second party has this day entered into an agreement with Samuel M. Jarvis and Roland R. Conklin selling to them a three-sevenths interest in certain water rights, money, bonuses, land, contracts, etc., and agreeing to deliver to them a certain amount of capital stock of a corporation to be formed, and it is further agreed that if second party keeps said other contract as made on his part then the corporation to be formed as contemplated by said agreement and to be known as the Bear River Canal Company, or such other name as may be agreed upon, may and shall issue its bonds in the amount of $2,000,000 which bonds shall be secured by a mortgage on all the property rights and franchises of said proposed corporation.

Said bonds shall be purchased from time to time as the work on the proposed canal progresses by the first party, at the price of seventy-five cents on the dollar of the face value thereof; said bonds to be payable both principal and interest at the office of the first party at Kansas City, Missouri, twenty years after date or at such shorter time as shall be agreed upon, and to bear interest at the rate of seven per cent. per annum payable semi-annually. It being understood that any interest which has by the terms of said bond accrued at the time of its purchase by the first party shall be credited on the same.

This agreement to purchase said bonds by the first party is subject to two conditions only viz.: that the issue of said bonds be in every way legal and valid and the mortgage securing them a valid and a first lien and provided further that in case of a financial depression which is unusual, making the money market unusually close the first party shall not be obliged to take any portion of said bonds at such time but shall have further and reasonable time to take and pay for them.

JARVIS CONKLIN MORTGAGE TRUST COMPANY.
ROLAND R. CONKLIN, Secretary.
JOHN R. BOTHWELL.

September 25, 1889, the Bear Lake and River Water Works and Irrigation Company was incorporated to take over the foregoing contract. The capital stock was fixed at $2,100,000 of which John R. Bothwell received $2,099,000. So far as can be determined this was pure promotion stock and the only thing Bothwell paid for it was certain water fillings and rights of way. It is to be assumed that Bothwell kept his contract with the Jarvis-Conklin Mortgage Trust Company and transferred to them a considerable portion of the stock that they immediately came into actual if only nominal control. Bothwell soon disappears officially from the company. A mortgage in favor of the Jarvis-Conklin Mortgage Trust Company was placed on the proposed dams, canals, etc., October 1, 1889 to secure the payment of $2,000,000. In June 1891 the mortgage was superseded by a trust deed.

The purposes of the company, as indicated by the articles of incorporation, were "to supply water for domestic, municipal and manufacturing uses to Ogden City, Corinne City, Brigham City, Bear River City and other cities and villages and their inhabitants and for irrigation of land and for all other useful and beneficial purposes." The water to be supplied was to be secured from Ogden River, Bear River, Bear Lake and reservoirs. For the purposes of supplying water the company was authorized to construct reservoirs, canals, ditches, conduits, dams, flumes, etc. The bonds were sold to secure capital for the construction of the system. They were secured by a mortgage on the canals and other property of the company and also were underwritten by the Jarvis-Conklin Mortgage Trust Company. A large quantity of these bonds were issued and purchased by the Quakers in Glasgow, Birmingham and New Castle, Great Britain. The bonds were the chief and almost only source of revenue of the new company.

The engineering work was performed by two men, Samuel Fortier and Elwood Mead, who have since become internationally preeminent in irrigation engineering. Mr. Fortier was active engineer on the work and Mr. Mead was the consulting engineer.

The plans provided for the construction of a diversion dam in the Bear River just east of the Cachè divide.

Two canals were to be constructed through the canyon, some six miles, one built on the north side of the river and one on the south. They were each fifteen feet wide and ten feet deep and built of masonry or tunneled through solid rock. Each canal was supposed to have a capacity of 1000 second feet of water. As the canals left the mouth of the canyon the one on the north side ran off to the north and west for the purpose of supplying Bear River Valley with water. The north and west side offered the greatest opportunity for agricultural development. The canal on the south of the river turned to the south for the purpose of irrigating the lands on the east side of the valley, and was intended to extend as far south as Ogden. The south branch was only partially completed and did not extend beyond Deweyville until the Hammond Interests extended it in 1903.

John R. Bothwell, the first president of the company, made a contract October 16, 1889, with William Garland of Kansas City to build the first twelve miles of the canals. Immediately upon the signing of the contract Garland began construction. As many as 7000 men were employed on the works at one time. The work progressed rapidly until December 10, 1889, when the company became delinquent in its payments. Moreover a dispute arose as to the amount due on the work completed as the payments were made upon the unit cost basis. William Garland claimed a balance of $125,000 the difference between what the company had paid him and the amount due. The company maintained that it owed Garland only the difference between $623,310.10

and $544,145.55 or $79,164.55 plus interest upon the same for the time it was past due. The dispute over the amount due arose from the fact that the company's engineer had made a mistake in measuring the number of cubic yards of earth and rock excavated by two subcontractors. The sub-contractors disputed the amount, took the matter to the courts and secured a judgment against William Garland on the ground that the engineer had erred. Garland maintained that inasmuch as the company had already paid him for this work according to the incorrect figures of the engineers that he should be allowed to amend his estimates to the company and receive payment on the revised estimates. He held this was especially true inasmuch as he was paid by the cubic yard. In order to protect his interest he placed a mechanic's lien on the canal. The account remaining unsatisfied, May 19, 1893, Garland began suit on his lien against the Bear Lake and River Water Works and Irrigation Company and the Jarvis-Conklin Mortgage Trust Company for the amount claimed, namely $125,000. The trial court sustained the lien and gave judgment for $89,551.33. There were three points at issue:

(a) The amount due.

(b) Whether a mechanic's lien took precedence over a trust deed which had been executed and filed before the lien had been placed on the property.

(c) Whether moneys received from the sale of the bonds were a trust fund for the payment of the construction of the dams and canals.

As already indicated, after hearing the evidence the court gave judgment for $89,551.33.

The Bear Lake and River Water Works and Irrigation Company and the Jarvis-Conklin Mortgage Trust Company maintained that the trust deed executed in their behalf being prior in time took precedence over the mechanic's lien. Chief Justice Zane, of the territorial Supreme Court, in an opinion afterward confirmed by the Supreme Court of the United States said: "Under the mechanic's lien law relied upon we do not think a man can execute a deed of trust on a canal to be constructed on the public lands and then employ men to build it, and after they have done so and claim the security of the lien turn upon them and say he had transferred the property to a trustee before their labor had brought it into existence."

Garland, in his third contention, maintained that the company had been organized without any assets, except certain water filings and claims in rights of way; that the stocks of the corporations were valueless as far as representing any real investment; and that the funds derived from the sale of bonds was a trust fund reserved for the payment of the construction charges of the canals, dams, etc., and that Jarvis and Conklin instead of treating them as such had used them to purchase 9,000 acres of land they held in their own names. This they did not deny but they contended that the funds were not held in trust but were company moneys which could be used as the officers of the company saw fit. The court did not express itself on this point.

William Garland's claim was protected by the legality and priority of his lien as upheld from the trial court to the Supreme Court of the United States. In addition to the difficulties with Garland the Canal Company was in general financial distress. The payments of interest on the bonds was delinquent and the system was not earning enough to pay running expenses. The problem had not worked out as it had been planned. The lands of the Corinne Mill Canal and Stock Company were not selling well. The public lands, in part at least, were held by speculators and they were not buying water rights but simply holding their lands with a view of selling them at an enhanced value which resulted simply from the fact that water was available; others honestly felt that the annual charge of two dollars an acre for maintenance and operation was too high and would not buy water; some few held off no doubt in the hope that if the company failed they could buy the water cheaper. As a result water for only about 12,000 to 14,000 acres had been sold, and in this critical condition a receiver was appointed, June 6, 1893. The same year the financial crisis bankrupted Jarvis-Conklin Mortgage Trust Company making its underwriting of the bonds valueless.

If the canal system was not to result in a total loss, something had to be done and reorganization was decided upon. If matters could be adjusted with the bond holders the situation might be saved. Reorganization was thought of and W. H. Rowe, a business man of Salt Lake City, was proposed for president and general manager of the company. Messrs. Rowe, Conklin and Jarvis went to Great Britain to meet the bond holders; to seek their consent to a reorganization; and, if possible, to get them to advance $125,000 additional money to complete a greater canal mileage. They secured the consent of the bond holders to a reorganization of the company and sold them $125,000 of new bonds.

On September 1, 1894, the company was reorganized, with W. H. Rowe of Salt Lake City as president and general manager, under the name of the Bear River Irrigation and Ogden Water Works Company. The Ogden City Water Works had been previously purchased by the old company. The capital of the new company was fixed at $2,400,000 to be paid for in the property of the Bear Lake and River Water Works and Irrigation Company. Thomas J. Flannelly, an agent of the Jarvis-Conklin Mortgage Trust Company, became a stockholder in the new company to the amount of $2,399,200. William Garland's claim still retained a lien on the canal property.

The new company formed a combination with the Corinne Mill and Canal Stock Company, the owner of the 45,000 acres of land. A very serious effort was made to sell the water and the land together for thirty dollars an acre, one-tenth down and the remainder in ten equal annual installments with an annual interest charge of seven per cent. upon deferred payments. Another scheme, to sell the land in tracts of twenty acres with a perpetual water right of one second foot for 80 acres and to plant the land into apple trees and to cultivate them for six years at an annual charge of $36 an acre, was promoted at the same time. At the end of that time the company would turn over to the purchaser a bearing orchard. To further assist the operation and maintenance charge was reduced from two to one dollar an acre.

About $80,000 was spent in advertising these lands, principally in Illinois, and this brought to the valley a capable thrifty class of farmers.

During the life of the Bear Lake and River Water Works and Irrigation Company, water rights had been sold to a large number of farmers. When the foreclosure of the company caused a reorganization and the failure of the Jarvis-Conklin Mortgage Trust Company made the underwriting of the bonds valueless, the bond holders were left wholly dependent upon the canals and lands of the irrigation company for security. In order to look into the situation a representative of the bond holders came to the valley and while there was unwise enough to announce publicly that the foreclosure of the old canal company had cancelled all the water contracts with the farmers and forfeited all moneys paid on them. This stirred up a veritable hornet's nest among the farmers. It was most unwise if the company was to interest new settlers, for if farmers through a simple process of reorganization were to be deprived of their irrigation water rights what security was there for future purchasers of water rights under a system already again financially embarrassed for the second time? The urgent need at that particular moment was more settlers and purchasers of land. Without them the project could not succeed and with such a situation confronting them settlers would not come. The farmers already on the project immediately organized a protective association and began litigation to protect their acquired rights.

It is useless to attempt, at this date, to follow the interminable series of law suits between the sub-contractors against the contractors, and the contractors against the company, and the land holders against everybody. Contests continued until there was created a veritable maze of legal complications as between law suits, liens, receivers and fundamental rights. The outcome of the situation was that the farmers ceased to pay their annual dues for land or water, simply holding their contracts in abeyance, and the revenues of the company were shut off.

During all this time, William Garland was patiently waiting with the thought that his comparatively small claim would be paid. He even offered to settle for $75,000. Finally it was necessary to sell that part of the canal covered by the lien, in order to settle the judgment. It was put up at auction and sold to Evans and Dooley of Ogden and Salt Lake for $125,000.

Due to the foreclosure and organizations and reorganizations of the system was now broken into three parts. The part of the system east of Point Lookout was owned by Evans and Dooley; the old Corinne Mill Canal and Stock Company by the Hammond Interests; and the Roweville canal by the bond holders. As soon as this situation developed another law suit was begun to determine their respective rights. This litigation continued for five years. In the meantime the farmers enjoyed the use of the water without any payments.

In 1902 the Utah-Idaho Sugar Company bought the canal system for $300,000 and the land for $150,000. The bond holders through the old company had entered into contracts to sell water to the farmers. They were unable to keep the contracts because of the loss of part of the canal system. The bond holders still being parties to the water contracts and the farmers insisted that they be fulfilled. The sugar company now relieved the situation by offering to sell water to the bond holders for a nominal sum if they would keep their contracts and sell it to the farmers. These terms were accepted by the bond holders and they completed their agreements with the farmers.

Since the purchase of the system by the Utah-Idaho Sugar Company, in order to develop the valley, the company has sold water at from $15 to $50 an acre.

Under the North and South canals there are now about 45,000 acres under irrigation and cultivation while the two systems are capable of supplying water to from 90,000 to 100,000 acres.

The system cost well over a million and a quarter dollars. In addition to this, in the numerous law suits and years of long drawn out litigation, there was considerable money wasted. The bondholders were the heavy losers. They lost almost their entire investment. A combination of circumstances seemed to make it impossible for them to realize the legitimate returns that they were honestly entitled to. For they had supplied the funds to establish what later proved to be a highly profitable enterprise. From the standpoint of water supply, engineering construction and fertile agricultural lands the opportunities were unsurpassed. Then why should it have failed to bring returns; first the company was organized on a highly speculative basis, all the stock and one-fourth of the issue of the bonds went to the promoters. That was certainly a considerable amount of "water" to put into a company of that size in the hope that it would survive and prosper. Secondly, in the beginning none of the lands to be irrigated belonged to the canal company and more than fifty per cent. of the lands were in private ownership. Of the privately owned lands 45,000 acres belonged to the Corinne Mill Canal and Stock Company. Public lands or public lands entered by settlers were likewise under no obligation to purchase water. In other words after the canals were built there was no assurance that settlers on the public lands or purchasers of private lands would, for years, buy water rights and as a matter of fact they did not. Many had secured the land merely to speculate upon it. Every year the company had to wait it was losing heavily in cost of maintenance and operating expenses, interest and depreciation. There was positively no way to overcome this. If the public lands could have been segregated and set aside as in the Carey Act where the water charge becomes a lien upon the land it would have been a great help but there was no law to make such an arrangement possible. Looked at candidly from every point of view it is impossible to see how the investors could have been protected against loss. It is certainly a pathetic financial story.

To-day the canals supply water to many acres of rich agricultural lands that sell as high as $250 an acre. Thriving towns and villages and sugar factories have been built upon the improved lands under the canals. The orchards as a rule did not prove financially successful and have, in many instances, been pulled out and supplanted by alfalfa and sugar beet. Hundreds of farm families are deriving support from these reclaimed lands and thousands of inhabitants are happy and contented and prosperous through the returns from them. These things make still more pathetic the fact that the poor men and women who brought this all about should be the losers.

The story of this undertaking has not been given because of its real value. It was, however, the first large commercial irrigation undertaking in Utah and one of the first in the West. It is typical of many irrigation schemes in the arid West, and shows how financially disastrous an irrigation scheme may be when uncontrolled by the State or the Federal Government.

CHAPTER XIII

STATE IRRIGATION PROJECTS AND STATE ASSISTANCE OF PRIVATE PROJECTS

From the first settlement of the commonwealth, the cities, the counties and the territory have extended aid in the construction of irrigation canals and ditches. It was only natural, then, that the territory, on seeking admission into the Union as a State, should, among its other requests, ask for a grant of land for the promotion and assistance of irrigation.

In accordance with such a desire, strongly expressed, Section 12 of the Enabling Act admitting Utah to statehood embodied the following provision: "For the establishment of permanent reservoirs for irrigation purposes five hundred thousand acres to be selected under the direction of the Secretary of the Interior from the unappropriated public lands of the United States in the State of Utah." These lands were to be sold by the state authorities and the funds derived from them used to build reservoirs. There has been sold up to date 485,607 acres for $819,110. By an act, dated March 11, 1897, the legislature created a reservoir fund to which should be credited all moneys derived from the sale of the lands included in the special grant. The fund was placed in charge of the State Board of Land Commissioners to be expended for the construction of permanent reservoirs. The law further provided that structures built in whole or in part by this fund should be under the supervision of a competent engineer appointed by the land board. This provision was amended in 1901 placing the supervision under the direction of the office of the State Engineer. The actual construction work was to be done by the State or by private contractors. Where the work was done by private contracts they were based upon competitive bids. Both methods were employed in the two state reservoirs built.

In 1897, very little of the lands belonging to the State Reservoir Grant had been sold, so there was at that time only a very small amount of money in the fund. It was also realized that if these lands were to be sold on the same basis as other state land, as to length of time of payment, that the returns would be slow coming in and a considerable period would elapse before the fund would be large enough to do anything. For purchasers of state lands were given ten years to pay for the lands in ten equal annual payments.

In order to make funds available, a law was passed in 1897 authorizing the land board to invest its funds in warrants of the reservoir fund at five per cent. interest. To make it possible for the land board to act upon any good opportunity, the sum of five hundred thousand was appropriated from the reservoir fund for the construction of reservoirs and canals.

The law of 1897 had authorized the land board to use the reservoir funds to construct canals and reservoirs, but in 1905 the board was also empowered to loan the funds derived from the reservoir land grants to "corporations or associations within the State for the construction of public or private reservoirs at not to exceed five per cent. interest." All loans must be first liens and must not exceed forty per cent. of the cash value of the land and the water rights. In the first law the board could only build reservoirs to supply water to publicly owned lands but by the new law it was permitted to sell water to privately owned lands. This was an essential amendment, for title had been already acquired to much of the dry lands for ranching or dry-farming purposes. There were considerable quantities of these lands in some places, some of them were very valuable and in order to make almost any project financially successful either water would have to be sold to the owners of the land or else the lands would have to be purchased, water supplied to them, and then resold. It was much simpler to amend the law and sell the water direct to the present owners who were anxious in most instances to buy it.

The law of 1913 laid down the principle upon which water under state projects should be sold. The law reads: "The charges shall be determined with a view of returning to the reservoir fund the cost of construction of the project with interest at the rate of five per cent. per annum computed from the date of the completion of the project." The working out of this principle will be considered when we come to the sale of lands under the Piute project. A further provision was incorporated in the law to the effect that the sale of water to owners of private lands, could only be made upon written contracts entered into before work was begun upon the water system. The necessity of this course is clear.

If the reservoir and canals were first built it would be a case of fixed capital which would be valueless for any other purpose competing for business. The land owners could go on as they had done in the past until the irrigation system was bankrupt and they could then buy it at their own price. It is clear that the reservoir and canals could not be moved or used for any purpose except to irrigate the land for which it was built, so this is certainly a wise provision.

The original provision fixed ten years as the length of time for the payment of the purchase price of the land. The total sum was to be divided into ten equal installments one-tenth payable annually. It does not appear that there was any particular reason why the period of ten years was agreed upon except that the United States Reclamation Act had adopted this time period for the payments of water rights purchased from the Government. The period is totally inadequate, if it is intended that the lands are opened up and made available for homes for poor men. The water and land under an irrigation project costs from thirty-five to seventy dollars an acre. Plowing, levelling and breaking cost from twenty dollars an acre up. In some instances it even reaches fifty or sixty dollars. In addition settlers, in many projects, have to build laterals themselves, When we consider that the expense of clearing the sage and breaking up the land; leveling it so the water will flow over it; and fencing the farm to protect the crops from range cattle all has to be done before a crop can be produced it can readily be seen that there is little hopes of any income worth speaking of before the third year. In the meantime a house has to be built for the family and some outbuildings for livestock. The effort required to put the farm on a producing basis is more than the ordinary individual without capital can accomplish. Payments for water should be suspended for the first few years and then the period of payment should be considerably lengthened. Because the raw land is sold for a nominal price per acre the word has gone out that there are free farms for the asking, but it takes a well-to-do-man to develop one of these free farms and at the same time support a family. It is also well to remember that it will be only a few years before the products from these lands will be necessary for the national support. So that either the State or the Federal Government will have to make provisions such that a man who enters such lands can make an adequate living and establish a home. It is the poor men who will have to do this work for well-to-do-men do not need to undertake the task. If well-to-do-men desire to farm they can purchase lands already well tilled. Due to the foregoing conditions it was soon found that the settlers in the Utah state projects could not make the earlier payments which, as already indicated, came due before the land was producing crops. In 1913 authority was given the State Land Board to lengthen the time of payments "when the interests of the State and the successful development and colonization of the land, require such action to abate payments of interest due from purchases of land and water or either of them; or to extend the time of payments on principal and interest due or about to become due with or without interest upon such terms and conditions as to the board shall seem just." This was a recognition by the legislature of the impossibility of meeting the conditions of sale of the land and water.

There was a public demand for reservoir construction and soon after statehood the legislature set aside a special fund for the land board to visit the different parts of the State to examine reservoir sites. In conjunction with the State Engineer several sites were examined and finally two were selected, the Hatchtown and the Piute.

In the annual report of 1906, the State Land Board sets forth that after careful examination they were very favorably impressed with the lands, the water supply, the dam site and the canal lines of the Hatchtown project in Garfield County. Following this thought on May 2, 1906; an option was taken upon the property and rights of the Upper Sevier Reservoir Irrigation and Fish Stock Company. The sum to be paid for the lands and water rights was $5380. As soon as an option to purchase was taken a more thorough examination was made of the site, a dam was designed and specifications prepared and bids called for. The contract was let July 18, 1907. With some delays the work on the dam and canals was carried on until they were completed on Nov. 30, 1908.

The elevation of the lands it was proposed to irrigate by the Hatchtown project was about 7,000 feet. The reservoir had a capacity of 13,500 acre feet and was designed to water about 6,000 acres. The total cost of the dam and the twenty miles of canal was $178,000. The price of land without water was fixed at $2.50 an acre and with water the price varied from thirty to thirty-five dollars an acre. The unit of sale was forty acres and where the unit was susceptible of only partial irrigation, due to being above the canal or water line a charge for water was made for only that part of the land that could be irrigated. The initial payments upon dry lands were twenty-five cents and for irrigated lands one dollar an acre at the time of purchase. On the next succeeding January, the settler was required to pay one-tenth of the total purchase price of land and water and on the first of each succeeding year one-tenth of the original cost together with five per cent. interest upon the deferred payments until the entire sum was paid. The maximum acreage sold to any one purchaser was limited to one hundred and sixty acres. In addition to the items already set out there was a maintenance and operation charge for the upkeep of the system.

The extension of payments and other favorable conditions made the project bid fair to become a splendid success. About eighty per cent. of the lands had been sold and was either under cultivation or were being rapidly put under cultivation, when on May 25, 1914, the dam gave way and was washed entirely out.

Various reasons were given by different engineers for its failure. The significant thing to the State, however, was that the dam was completely destroyed and the money expended upon it was entirely lost. Finally after several investigations by experts the authorities have decided not to rebuild the dam because of a poor foundation. At the last legislative session, 1919, a settlement was made with the purchasers of the land in consequence of their loss, through a failure of the State to supply water, according to its contracts.

Prior to 1905, citizens of Sevier Valley had taken steps to build a dam and store water on the Sevier River about ten miles from Marysvale. The stored water was intended to be used to supplement the then existing supply of the valley and to irrigate a tract of new land in addition. The farmers of the valley interested in the new venture organized the Otter Creek Reservoir Company. In August 1907 the company proposed to the State Land Board that it take over the project on the basis that the State compensate the company on the actual outlay which was very small. An option to purchase was first agreed upon, after which the State Engineer's office began a careful investigation of the natural conditions, water supply and bed rock in order to determine whether a reservoir at this point was possible. An affirmative decision at the conclusion of the investigation, led to the purchase of all the rights of the Otter Creek Irrigation Company. The company was paid $542. The proposed reservoir would flood 2174 acres of land of which 1823 acres were in private ownership. These lands were bought at a cost of $35,000. The work on the outlet tunnel was begun June 18, 1908, and on the dam proper March, 1911. Considerable preparatory work was necessary as the work was done by the sluicing method. The system was practically complete by the close of the year 1914. The dam was constructed directly by the State whereas the 54 miles of canals were built under contracts. The completed Piute Reservoir holds approximately 93,000 acre feet of water and it and the canals cost the State $790,000. The stored waters will irrigate 35,000 acres. These lands have sold from three dollars per acre for non-irrigable land to $71 per acre for irrigable.

The law fixed the price of the water at the cost of the project but did not fix the price of the state owned lands and some of these sold without the water as high as $36 an acre at competitive sales. Such lands were sold at $2.50 per acre before the construction of the reservoir. This is a splendid example of the law of joint demand. In this instance the price of one element was fixed and the other rose immediately until the two combined produced a value generally accorded to land and water in the community.

In accordance with the law private owners of land who desired to purchase water from the Piute Reservoir had to enter into a contract with the State before the project was begun. The purpose of such an arrangement was to protect the investment the State was about to make. . . . .

The contract under which water was sold to the private owners of land fixed the sale price for an acre at the pro rata cost per acre of the water with a provision that a water right for an acre should not exceed $30 per acre. The payments were to be made in ten equal annual installments. Both in the Hatchtown and the Piute Reservoir projects the board had the authority by law to abate the interest and to defer the annual payments, if the settlers were not able to meet them. Until all payments were made in full for the water the water rights were appurtenant to the particular piece of land for which it was purchased and the contract entered into for the water was a first lien upon the land. The amount of water to be supplied to users under the system was a maximum of two and one-half acre feet. If for some reason the supply failed so that there was not sufficient water for the entire area at two and one-half acre feet the entire acreage covered by the system was to suffer a proportionate reduction. The State Board of Land Commissioners was to retain control and management of the reservoir and canals until the State was reimbursed from the sale of water rights for the cost of the entire system. When the water right is paid for in full, the purchaser is to receive from the State a patent conveying a clear and unencumbered water right title together with a pro rata interest in the reservoir and canals.

STATEMENT OF EXPENDITURE AND RETURNS OF THE HATCHTOWN AND PIUTE PROJECTS

COST	
Hatchtown Project	$178,000
Piute Project	$790,000
TOTAL	$968,000
RETURNS	
HATCHTOWN PROJECT.	
6,000 Acres of land at $2.50 per acre	$ 15,000
8,000 Acres of water at $35 per acre	$ 280,000
PIUTE PROJECT	
12,500 Acres of land at a valuation	$ 200,000
35,000 Acres of water at $35 per acre	$1,225,000
	$1,640,000

The Piute project was sold to the farmers using water under it, April 1, 1920, for about one million three hundred dollars.

As indicated in preceding chapters, the earlier irrigation undertakings were largely individual and cooperative. These naturally selected the simpler and easier projects but as the State has grown in population the more expensive and more difficult dams and canals have been undertaken. Such enterprises involve the expenditure of considerably more capital and likewise a greater cost per acre irrigated. The amount of capital involved is ordinarily too large for poor settlers or for one investor. As a rule the organizations take on the form of legal corporations. As a matter of fact most of the earlier canals built by communities as cooperative undertakings for administrative purposes and convenience are now organized as corporations. If the growing agricultural population of the State is to be supplied with new lands to meet its needs the larger undertakings must receive State or Federal support. According to the provisions of the law of 1905 the State Board of Land Commissioners have extended loans from the state reservoir fund to the following companies:

STATE LOANS TO IRRIGATION PROJECTS

DATE	NAME	AMOUNT	PAID	UNPAID
1912	New Hope	$ 20,000	$ 2,700	$17,300
1907	Irrigation Lands Co.	100,000	20,000	80,000
1911	Green River Irrigation Co.	50,000	4,000	46,000
1912	Cache Valley Irrigation District	20,000	20,000	20,000
1907	Deseret Irrigation Co.	70,000	63,000	7,000
1912	Sego Irrigation Co.	35,700	17,850	17,850
1913	Timpanogos Irrigation Co.	12,500	6,250	5,250

By some persons this would be regarded as paternalism, but it does not need prophetic vision to see that before many decades have passed the State will have to make more liberal extensions of credits to irrigation undertakings and either it or the Federal Government will have to engage directly in the construction of irrigation projects on a large scale. As a matter of fact state or Federal undertakings are the more logical. Private undertakings are always based upon the hopes of large returns. Sometimes the profits are large; sometimes they are small. The State or the Federal Government can afford to forego profits and look at the larger results. The Federal Government has the advantage for it owns most of the land; it can secure the proper kinds of construction machinery which it can use for several projects, and it can construct the plants cheaper than private enterprise. The government can also extend supervision and credits to poor settlers that a private company can not do. Moreover it can select its settlers so as to avoid the speculator and the agriculturally unfit and place on the land a class of real home builders. Critics may apply to the undertaking the word paternalism or any term they may select, but if it does not belong to the activities of the government to assist in developing its resources in the interest of the people then it is difficult to see what important function in should perform.

CHAPTER XIV

THE CAREY ACT

The early undertakings in irrigation reclaimed the lands that were most accessible to the streams and the springs. Generally these lands could be irrigated by small canals or ditches constructed by individuals or by small communities. The time came, however, in the arid West when the low lands which were easily reclaimable were nearly all under cultivation. The lands that lie some distances away from the streams and up along the foothills of the mountains are freer from alkali, possess better drainage facilities and are easier to till than the low lying soils. This was due chiefly to the fact that the fertile soils of the mountains have been washed down by the spring floods and have lodged upon the mesas or plateaus. These soils are often several feet in depth. In order to irrigate them, it was necessary to construct expensive canals with their sources far up in the canyons. In constructing the high-line canals, well up on the sides of rocky canyons, it is necessary to fill ravines and blast tunnels through ledges of rock, a very costly undertaking.

For an individual, or even a small community of poor settlers, to reclaim these very valuable lands by irrigation is an impossibility. They lack the financial resources for its accomplishment for it must be borne in mind that no returns from this soil can be obtained until an expensive system of canals has first been constructed and water turned on the land. It is true, that due to community cooperative undertakings, relatively more had been accomplished in Utah at an early date, in reclaiming these high lands than in any other Western State. Still there were many large feasible undertakings that had not been considered.

The Homestead Act had permitted any entryman to acquire 160 acres or a fraction thereof. This was large enough an area for a man without capital to reclaim and irrigate. Yet by some unexplainable reason, perhaps in the hopes of encouraging men with capital to undertake the reclamation of arid lands, Congress in 1877 passed the Deseret Land Act which allowed the entry of 640 acres. It applied to the public lands in the arid States and territories, except Kansas, Nebraska and Oklahoma. Land that would produce sufficient native grasses to make a crop of hay or land that would produce an average crop of any kind without irrigation did not come under the provisions of the law. The entryman had to be twenty-one years old and a resident of the State. Residence on the land was not required, but each year for the first three years proof must be filed in the land office showing an expenditure of at least one dollar an acre for the acquiring of water, the construction of canals or the erection of farm fences and buildings. Before final proof could be made and patent obtained certain very definite requirements, pertaining to water rights and the area under cultivation must be met. In addition to the foregoing requirements an initial payment of twenty-five cents an acre had to be made, and an additional dollar an acre at the time of final payment was required. In 1891 the number of acres was reduced from 640 to 320.

Under this act, however, no considerable area of land in Utah was reclaimed. The same can likewise be said of other States. The failure was primarily due to the fact that the legislation was based upon the theory of individual action; an impossible procedure in reclaiming any considerable area of arid lands. The area was altogether too large for the individual irrigator to reclaim and altogether too small for the capitalist to consider with the view of supplying water and selling it to actual settlers. The act fell far short of accomplishing the purposes of its promoters.

In many cases private capital had undertaken the construction of irrigation systems which would supply water for large areas of arid lands, e. g., the Bear Lake and River Water Works and Irrigation Canal in Box Elder County, Utah, has already been mentioned, but there was no way of having the public lands, which the canals were intended to irrigate, withdrawn from entry. Neither could any legal requirement be made of the settlers or entrymen on the land obligating them to purchase water for irrigation from the canal company upon the completion of the system. Thus there was no protection for the companies that had invested their capital in the enterprises. The result was that as soon as the canals were well toward completion actual settlers and land speculators would enter upon the land under the Homestead and pre-emption land laws of the United States and conform sufficiently to the laws to secure title to the land. It would then become a waiting game. Perhaps a little dry farming would be carried on but the land owners would refuse to purchase permanent water rights for the land or even to buy an annual supply. In the meantime, due to the fact that water was really available, the land would rapidly increase in value by merely holding it. The canal system, on the contrary, was a constant source of expense whether in use or not. A canal will frequently deteriorate more rapidly when idle than when in use. If the settlers bought little or no water it can be readily comprehended how the system could not possibly pay expenses. In the construction of a system the estimated income for interest payments, operating and maintenance expenses was based upon the returns obtainable from the use of water upon the major part of the entire area covered. It certainly would not pay if only a small portion of the land was irrigated.

In a vast majority of cases where the canals were built as capitalistic undertakings the ventures were unprofitable either through a miscalculation of the cost or through a failure to sell the water. In many instances the companies became bankrupt. The Bear Lake and River Canal cost over one and a quarter million dollars from 1889 to 1893 and sold at a bankruptcy sale in 1894 for $125,000. Yet it was an entirely feasible undertaking; there was plenty of water; the cost per acre of land to be irrigated was reasonable and the land itself was first class. The difficulty, however, was in part due to the fact that the settlers and speculators owned the lands and would not buy the water. Some bona fide settlers deliberately delayed the purchase of water rights until they were sold cheap which usually happened after the system had passed through a court of bankruptcy.

With the number of failures before them, capitalists refused to invest further in irrigation enterprises until means were provided whereby they could compel settlers upon public lands, for which an irrigation system was proposed, to buy water rights within a given time after the water had been supplied to the land. If the arid states were to develop and become more thickly populated large irrigation systems must be built. Such undertakings were too large for a few scattered settlers so either the states themselves, the Federal Government or capitalists would have to undertake the task. At this period of national development neither the States nor the Federal Government would consider the reclamation of arid lands, so in order to encourage private capital the Federal Government passed the Carey Act, August 18, 1894. It was christened for Senator Carey of Wyoming who introduced the bill and secured its passage. The provision first appeared as an amendment to the Sundry Civil Expense Bill and appears in the law as section 4. The full section is as follows: "That to aid the public land states in the reclamation of the desert lands therein and settlement and cultivation and sale thereof in small tracts to actual settlers, the Secretary of the Interior with the approval of the President, be and hereby is authorized and empowered upon proper application of the State to contract and agree from time to time with each of the States in which there may be situated desert lands to donate, grant and patent to the State free of cost for survey or price such desert lands, not exceeding one million acres in each State as the State may cause to be irrigated, reclaimed, occupied and not less than twenty acres of each 160 tract, cultivated by actual settlers within ten years next after the passage of this act."

The provision obviously intended that the arid States themselves would either undertake the actual reclamation by furnishing capital and undertaking the construction of reservoirs, dams and canals or that the States would lend their credit to communities of settlers or companies to accomplish the same purpose. Such a provision was impossible of execution because the arid States did not possess the available funds and furthermore in most instances if they had possessed the capital their state constitutions forbade their extending credit to private undertakings. The Utah constitution reads as follows: "The legislature shall not authorize the State or any county, city, town, district, or other political sub-division of the State to lend its credit or subscribe to stock or bonds in aid of any railroad, telegraph, or other private individual or corporate enterprise or undertaking." Most of the Western States found themselves in similar positions.

Even if the States had possessed the necessary funds and if there had been no constitutional obstacles in the way, the law itself contained an unsurmountable difficulty. It fixed a period of ten years from the passage of the law for the completion of any project undertaken. Such a period of time was entirely too short to undertake a piece of work of any magnitude. To begin with it took nearly two years after the passage of the act for the preliminaries to be worked out by the Federal Government and then the State Legislatures had to enact the necessary legislation before any action could be taken. At the best about all the States could do was to accept the provisions of the act and look forward to more favorable legislation. Utah was not admitted into the Union as a State until January 1896. Thus from the very nature of the situation the time was very much reduced for Utah accepted the provisions of the act in 1901.

In 1896 the Carey Act was amended, and States accepting the act of August 18, 1894, were authorized to create a lien or liens upon the several divisions and subdivisions of the land for the actual cost of reclamation together with reasonable interest and profit from the date of reclamation until the actual disposal of the lands to the settlers. Moreover when a particular area was supplied with water by a substantial canal even though the area actually irrigated was only part of the area to be reclaimed the new amendment provided that patents should issue "to the State without regard to settlement or cultivation." A further amendment of March 3, 1901, provided that the term of ten years should begin to run from the date of the approval of the project by the Secretary of the Interior. If the ten years did not prove sufficient for the completion of the irrigation project the Secretary of the Interior may, at his discretion, extend the time five years longer. Both of these amendments were essential. They made it possible to undertake the reclamation of arid lands by companies with capital because a lien was created on the land reclaimed until such time as the settlers had paid for the water. Ten to fifteen years was a reasonable time for the construction of a system and the sale of the lands. But in the larger opportunities for reclamation even fifteen years was too short. The second amendment permitted the sale of the water and land as each unit was completed. By these two amendments at least a reasonable time was provided for construction and sale and also a way was opened for returns whenever a unit of the system was completed and the lands placed on sale. On March 15, 1910, the law was further amended providing that upon the application of the proper state official the Secretary of the Interior could temporarily withdraw the lands it was proposed to include within the boundaries of a Carey Act project. This provision was highly necessary in order to prevent speculators from locating upon lands that were under investigation for a Carey Act project. Before this provision was enacted it was the common practice, as soon as the information leaked out that a reclamation project was to be undertaken, for speculators to locate on the land in order to be bought out by the company or to enjoy the enhanced price of the land as soon as water was obtainable. The entry of the land before it was withdrawn prevented a lien being placed upon it. The amendment of 1910 prevented such entries by permitting a temporary withdrawal for investigation purposes.

The State Board of Land Commissioners of Utah in 1897 recommended the acceptance of the provisions of the Carey Act but it was not until March 14, 1901, that the legislature accepted its provisions and placed the responsibility of carrying it into effect on this board. There was not a ready response to the provisions of the act. In 1902 the Board of Land Commissioners expressed itself as follows: "Thus the Carey law has proven absolutely valueless to the State of Utah, due undoubtedly to the lack of water for irrigation or the extraordinary cost, as compared with the value of the land of conserving water during flood periods for use when required for maturing crops." It is true that the value of land was low at that time but the statement is almost prophetic of the entire history of the Carey Act in Utah to date. This is not because the State does not offer opportunities but because of the inability to finance large undertakings. In Utah several very large undertakings are possible. Too large in fact for private capital at the present stage of Western development. The Carey Act at best is only a compromise. The idea is the employment of private capital for the development of irrigation projects and the sale of land and water to settlers, but the profits expected by the promoters are usually too large for the new settler to pay. Pioneering is difficult enough under the most favorable circumstances but to impose upon it the payment of a large sum for profits in addition to the legitimate charges for securing water is a burden the settlers cannot carry except in a few of the more feasible and cheaply constructed projects. The smaller irrigation systems should be constructed by the State and the larger ones by the Federal Government. Agriculture is a primary industry and at the foundation of national success. The development of agriculture and home-making should be two of the principal concerns of the State. It would seem for a nation that has done much in the way of tariff and bounties to encourage the development of manufacturing, that the least it could do to encourage rural home-making and agriculture would be to grant them an extension of its credit, under proper safeguards for payment of the principal and interest. Under such circumstances many of the larger areas would financially justify irrigation systems and in all cases the settler and farmer would be assured much greater stability in the undertaking.

By the law of 1901, Utah in addition to accepting the provisions of the Carey Act, placed the authority for making contracts and carrying the act into effect in the State in the hands of the State Board of Land Commissioners, subject of course to the provisions of the act itself. In general the provisions of the law were as follows: any person or corporation desiring to extend or enlarge an old system or construct a new one under the Carey Act must file with the board an application for the selection of the lands to be reclaimed. A description of the system by which it is proposed to reclaim the lands must accompany the application. Such description must give the source and estimated supply of the water and also an estimate of the cost of the entire system with the maximum cost of water per acre for a perpetual water right together with the annual maintenance and operation charge. The individuals or corporations making the application were required to supply such information as would enable the state board to determine their financial responsibility. As an evidence of good faith on the part of the applicant it was required that a certified check of at least $250 must accompany the application.

When the requirements are fully met, it becomes the duty of the State Board of Land Commissioners to determine whether the project is feasible; whether the capacity of the proposed works is adequate for the area to be covered; whether the construction charges are reasonable; whether there is sufficient water to irrigate all the land; and whether the land is desert in character. If the investigation established all these facts favorably and others set forth in the application, the land board must publicly advertise the application for thirty days so that any one desiring to object may do so with all the facts and information available. The board has authority to reject the application in its entirety or require certain changes or amendments to be made. If the application is approved it becomes the duty of the board to enter into a contract involving every detail of the undertaking with the individual or the company so as to protect the State, the settlers, and the promoter. The contract must contain special sections dealing with the nature and durability of the construction works; and the price of a perpetual water right to the settlers together with the amount per acre of the annual operation and maintenance charge. The board at its discretion may include a provision in the contract that the settlers upon the full payments of all water charges for a permanent water right shall acquire an interest in the irrigation system in the proportion that the payments made by each user bears to the total cost of the system or in the proportion that the individually irrigated lands bear to the total lands irrigated. The contract must specifically provide for the amount of water that the canal system is annually to supply each acre of land.

In the construction of the dams and canals, if the terms of the contract are not being lived up to the board can after a notice of sixty days and a failure on the part of the contractor to comply with the requirements of the contract bring action in the courts to forfeit to the State the work already done. If the court decides that the quality of the work or the delay in construction justifies a forfeiture to the State, the State Board of Land Commissioners is required to advertise for a contractor to complete the work. If a bid is received the former contractor is paid the difference between the bid to complete the work and the original bid. If no bid is received for the completion of the irrigation system the board can recover on the bond of the original contractor and do the work itself.

The settler has to purchase the land separately from the State. The price is fixed at one dollar an acre. Twenty-five cents per acre is paid at the time of entry and the remainder at the time of final proof by the settler.

All funds accruing from the sale of lands and the fees collected, after the payment of the actual expenses of the board while employed upon Carey Act projects, were to be placed in the state treasury as a special fund to be used for the reclamation of arid lands.

A very important provision of this law is that the water rights acquired by the land owners under the Carey Act in the State of Utah are to be attached to, and to be appurtenant to the land as soon as the title of the land passes from the United States Government to the State, which takes place when the system or any unit part of it is complete. This is an excellent provision. It is unfortunate that it does not apply to all the irrigated lands and waters within the State. The free and open sale and barter of water separate and apart from the land should not be permitted by a State.

On notice by the company that the entire system or any unit part is completed the Board of Land Commissioners examines it and if satisfied applies to the Secretary of the Interior for a patent. As soon as this is secured and the residence requirement is fulfilled the settler is required to appear and make proof of cultivation and actual residence. It must, however, be borne in mind that even when the patent is issued to the settlers by the State that the individual or company supplying the water for any tract of land has a first and prior lien upon the water rights and the land until all deferred payments are made. A failure to make a payment subjects the owner to foreclosure according to the law applicable to any ordinary mortgage.

Since the acceptance of the Carey Act by the State in 1901 there have been 25 applications under the law. In 1913 the area applied for amounted to 999,823 acres of which the board had approved 830,494 acres. This marked the high water point. Since then there has been a decline in acreage by withdrawal, disapproval or failure of promoters to go forward with the work. Up to date in the State of Utah about 23,000 acres of land have actually been reclaimed under the Carey Act provisions. Considering the fact that careful engineers estimate that there are easily 600,000 to 700,000 acres of good fertile land in the State still reclaimable with sufficient water to irrigate it, it does not appear that the Carey Act is suited to the needs of this work.

STATEMENT OF CAREY ACT, 1918

TABLES OF PROPOSALS FOR CAREY ACT SEGREGATIONS ON NOVEMBER 30, 1918
(Not including Proposals Canceled and Closed Prior to November 30, 1918)

App. No.	List No.	Acres	Rejected by Board	Approved by Board	Segregation List	Segregated by Interior Department	Withdrawal List	Withdrawal Allowed by Department	Deposits	Deposits Refunded	Proposal Canceled	Remarks
8	3	43,119.83	....	43,119.83	43,119.83	43,119.83	....	....	$250	$250	....	Bond re- [leased
9	5	29,839.87	....	29,839.87	29,839.87	29,839.87	....	....	1,000	....	....	
11	6	40,339.99	....	40,339.99	....	....	40,339.99	....	2,500	....	....	
13	4	4,959.15	....	4,959.15	....	4,959.15	....	....	750	....	....	
14	7	10,635.02	....	10,635.02	10,635.02	10,635.02	....	....	500	....	....	
16	9	14,487.84	....	5,384.32	....	....	5,384.32	1,264.33	1,250	....	....	[vacated Withdrawal
17	10	151,829.65	....	151,829.65	151,829.65	....	....	....	15,500	250	....	
18	8	22,868.30	....	22,868.30	22,868.30	....	....	....	1,000	....	....	
19	11	7,500.28	....	7,500.28	7,500.28	....	....	....	2,000	....	....	
20	12	4,124.84	....	4,124.84	....	....	4,124.84	4,124.84	250	....	4,124.84	" "
21	13	4,976.23	....	4,976.23	4,976.23	....	....	....	250	250	....	
22	P2	23,131.76	of lands segregated in List 2			....	....	....	250	....	....	See list 2
6	..	100,000.00	100,000	....	....	....	....	....	250	....	100,000.00	Conflict 23 Canceled
24	14	128,760.63	....	128,760.63	....	....	128,760.63	....	250	....	....	
25	15	332,929.47	....	332,929.47	....	....	332,929.47	....	500	....	....	
..	..	919,502.86	100,000	782,267.58	270,760.18	88,553.87	506,539.25	5,389.17	$26,750	$750	104,124.84	

Carey Act entries in force November 30, 1918 — 28,905.25 acres.

CHAPTER XV

RECLAMATION SERVICE

The justification for including this chapter in this treatise is that Utah has one very successful irrigation system under the United States Reclamation Service and in the very nature of things when the Colorado basin is eventually reclaimed, as it necessarily will be by the reclamation service, Utah will have hundreds of thousands of acres under the same system. The only power financially strong enough to carry through the Colorado Basin reclamation is the Federal Government.

After eight years of rather profitless experience with the Carey Act, it was apparent to the leaders of the West that if the immense tracts of sunburnt but fertile lands were to be reclaimed it would have to be by some other power than private capital. For the simpler forms of irrigation, private initiative and private capital did well enough but not so with the vast areas of excellent lands that were difficult to supply with water. Private interests must look for profit and could not take into serious consideration the placing of men on the soil and the establishment of families on the lands simply with a view of making homes and the building of commonwealths. The social problem means nothing to the private initiator. His problem is the investing of capital in such a way as to realize the greatest possible returns, consistent with security. At the then existing price of land (1902) private capital would not undertake the larger projects. If the lands were to be redeemed it must be by the Federal Government. The government could afford in order to build commonwealths, to forego all idea of profits and with the capital returned, to look largely to the economic and social results.

Naturally the Western States were anxious to have larger and denser population. Up to a certain point a dense population has advantages. The burdens of building better roads, establishing better schools, libraries and churches are relatively lighter. The sparse population of the Western States made the enjoyment of these essentials of civilization very expensive. The hope of bettering such facilities and lightening the taxes made a strong appeal to the existing population. Besides, to the average American, bigness in itself is an important element.

There were other elements in the situation that the Easterner did not understand. If the vast Western ranges were to be used to their greatest advantage in the production of meat and wool some means must be provided for feeding the herds during the periods of deep snow in winter. Too long, large herds of cattle and sheep had been allowed to perish in winter snow. Both the ranges and the live stock were becoming too valuable for such treatment even if the humane sentiment, which was now beginning to be felt, was left out of consideration. The irrigated areas to be reclaimed would supply forage for these herds in winter.

The hills and mountains of the Rocky Mountains and the Sierra Nevada Mountains were filled with almost every kind of mineral of economic value; many very valuable to the welfare of the nation. Without producing farms within reasonable distances it would be exceedingly difficult to supply the population necessary to open and operate these mines with food products. To transport all of them from humid regions would be almost prohibitive and the quality at best after such a long journey would be very poor.

The people of the Western States were fully cognizant of the fact that the public domain within their boundaries belonged to the Federal Government and that the funds received from the sale of these lands could be used as the government saw fit. A vast majority of the early settlers of these Western lands were descendants of the early settlers of the Atlantic Seaboard. They remembered distinctly that after independence had been won each State retained possession of its public lands. They had seen these lands sold and the returns received from them applied to some public purpose. The West was a difficult section of the nation to settle, and it occurred to them that inasmuch as the public lands were being sold why would it not be possible to borrow the funds derived from the sales to reclaim other public lands which in turn could be sold. The Federal Government would not be the loser but the gainer as in the end more land could be successfully settled. The borrowed money would be placed in a fund to build irrigation reservoirs and canals to supply water in the main to government lands. When the funds were repaid by the settlers they would be used to reclaim other lands until all the public domain susceptible of redemption would be redeemed. Then the funds would revert to the national treasury.

In preparation for the work now at hand, the geological survey had conducted water investigations for twenty years. This work included the measurement of the natural flow and the flood waters of the streams and the determination of reservoir sites.

For three or four years the discussion had run along the lines of using the funds derived from the sale of public lands for the reclamation of arid lands. With this idea in mind the senators and representatives of the Western States prepared a measure appropriating the funds derived from the sale of Western lands to a reclamation fund. It was introduced into the National Congress, passed June 17, 1902, and became known as the National Reclamation Act.

The supporters of the measure maintained that it would help to reclaim the West, particularly the large projects that could not be reclaimed by individuals or private corporations; it would afford homes for home seekers; it would put the public domain in a condition so that it could be sold; and finally that it was only a loan of the public funds which would be fully repaid.

There was some bitter opposition from the Eastern States. It was held to be unconstitutional because Congress had the authority only "to dispose of public lands." It was contended that this provision in the constitution meant the sale and not the improvement of the lands before sale. Moreover, the public lands were the property of the nation and the funds derived from them belonged to all. Therefore the use of these funds for this purpose meant the taking of them from citizens of the East and loaning of them to the West. The result would be that the Easterner would have to bear additional taxation to make good this diversion of funds. In addition to the heavier taxes it meant increased competition to the farmers of the East by the opening up of the new agricultural lands. One point of opposition proved true, namely, that the work would be begun, the funds would prove inadequate, and Congress would be asked for a loan. Mr. Ray, Congressman from New York, summed up the opposition as follows: "I say the bill is unjust and unfair to the farmers of the East. I say it is unwise and improvident as a scheme. I say that it is a dangerous power to put in the hands of the Secretary of the Interior and that there will be scandal. I say that the revenues, the moneys derived from the sale of public lands would prove insufficient to carry out this scheme; and within three, certainly within five years those interested would be appealing to Congress to appropriate money out of the public treasury with which to carry on and complete the scheme."

The National Reclamation Law was approved June 2, 1902. It was the first attempt on the part of Congress to aid directly in the construction of irrigation works upon the public lands. It was an effective realization on the part of Congress that water and not land is the all important factor in Western development. In the arid States water is the measure of production and agricultural development. If the West is to have a larger population the water that now runs to waste must be stored for irrigation.

The National Reclamation Act provides that the proceeds of the sales of public lands, except a small percentage set aside for schools shall, "be set aside and appropriated as a special fund to be known as the reclamation fund, the same to be used in the examination and survey and the construction of and maintenance of irrigation works for the storage, diversion and development of arid states and territories." The funds thus set aside were considerable because the sales of lands amounted to several millions of dollars annually. They were to be spent upon projects selected by the Secretary of the Interior after proper surveys had been made. Before making surveys of the land and the water which it contemplated bringing under the reclamation project the Secretary of the Interior was authorized to withdraw the lands from entry. The object in doing this was to make all the lands, in case the project proved feasible, subject to the provisions of the act. The most important provision of the act is the one which makes the water charge a lien upon the land. If the land was homesteaded prior to its withdrawal this could not be done without the consent of the homesteader. As soon as practicable after the withdrawal of the lands a complete survey was made to determine the feasibility of the project. If unfeasible the lands were restored for entry but subject to all the conditions of the Homestead Act.

The actual construction work of the reservoirs and canals could be done by the reclamation service itself or by contract. Both systems have been employed.

In the earlier undertakings it was the policy to open the lands for entry soon after the project was begun. An estimate of costs subject to subsequent change was made and the settlers admitted. Entry-men at once crowded upon the lands under the Homestead Act in the hopes of obtaining a free farm. Frequently it was years before the water was available for irrigation. Living on the land during all this time was almost impossible unless the settler was fairly well to do before entering upon it. He could not move away, even temporarily, without losing the right to his claim. So he had to remain on the land. Most of the settlers were very poor and had to labor upon canal construction in order to live. But such employment of their time did not enable them to prepare their land for crops.

Construction work on reclamation projects could not be carried on in many sections of the West in the winter season. Yet the settlers were so isolated that when work was suspended they could find nothing to do and often found themselves in want, because they could not desert their families and go elsewhere. At the same time the frozen ground made it impossible to work on the land in order to remove the sage and to prepare it for crops. So when the water did eventually reach the land and construction work stopped the settlers found themselves without income and with farm lands unprepared for crop production. This policy was remedied in 1910 by keeping the project closed until the water was ready for use and those already on their lands were permitted to obtain a temporary leave of absence until the completion of the project. Even when the water was at hand it was a long hard struggle.

The sage brush had to be removed and the land leveled so that water would flow uniformly over it. Often it was at least two years before a crop could be produced by the end of which time the poorer settlers had been starved out. Through much advertising a new crop of farmers was at hand to begin the work where the old ones had left off. In many projects it required three crops of settlers before they became established. This in brief is a history of too many of the reclamation projects of the United States. If the Federal Government is to continue reclamation work, as it will have to do there being no other organization in the nation strong enough for the immense undertaking, it will have to render more financial and industrial and social assistance to the new settlers. A supply of water is not sufficient. No government can afford to bankrupt two or three crops of settlers and make anarchists instead of farmers out of them. It had better leave the entire thing alone. The early pioneers had only unyielding nature to fall back upon but the new settlers are not willing to endure such hardships.

Before a United States patent can be issued to the homesteader he has to pay for his water in full and reclaim at least one-half of the total irrigable area of his entry. Until such time the United States retains a first lien against the land. This works a hardship upon the settler because with a first lien already upon the land it is practically impossible to pledge it for a loan to assist in development.

The maximum water right allowed to any entryman or land owner is the amount necessary for 160 acres. Where the owner possesses more than that amount of land the only way to secure water for it is to sell the land to other holders. If the lands are sold it must be a bona fide sale to an owner resident upon it or in the locality. Forty to eighty acres of public land is the usual farm tract, but in certain projects where highly intensified farming, especially fruit production is carried on, the farm acreage is placed as low as twenty acres. Whether these small farms are economic units for production and operation is an open question. It is doubtful from investigation made whether they will be found large enough to pay.

The price of water was first divided into ten payments but by the law of August 13, 1914, was changed. It now reads as follows: "Any person who hereafter makes entry shall pay into the reclamation fund five per centum of the construction charge for his land as an initial installment, and shall pay the balance of said charge in fifteen annual installments, the first five of which shall each be five per centum of the construction charge and the remainder shall each be seven per centum until the whole amount shall have been paid. The first of the annual installments shall become due and payable on December 1st of the fifth calendar year after the initial payment."

The control of the irrigation canals passes to the owners of the lands to be maintained and operated by them when they have paid for the major portion of the lands irrigated from the government service. The title to and operation of the reservoirs remain in the hands of the Reclamation Service. The original plan was for the settlers to construct the laterals but this was found impractical and the government finally built the laterals.

In the construction of reservoirs and canals, it was often possible to develop large quantities of hydroelectric power which could be used to pump water to high level canals or sold to consumers on the project.

The production and consumption of power to be used in the pumping of water has been found very economical. Where the supply of electricity has been greater than that needed to pump irrigation water it has been sold to towns and villages in the vicinity at a very low price. So cheap in fact is it that consumers in some sections such as on the Minindoka project use it to cook, heat living rooms, and school houses.

At once upon the Reclamation Act going into effect, the Secretary of the Interior segregated several large tracts of arid lands and after proper investigation commenced work upon those that were feasible. This was possible through the extensive hydrographic work of the Geological Survey. By 1910 it was obvious that the funds on hand and expected from the sale of public lands would not complete the projects already undertaken. That year Congress authorized the general treasury to make a loan of twenty million dollars to the Reclamation Service. In order to provide these funds the Treasury was authorized to sell certificates of indebtedness to secure the money. The loan was to be repaid to the Treasury from the sale of public lands. It was not payable, however, until 1915 when 50 per cent. of the funds derived from the sale of public lands were to be applied to this purpose.

The water rights obtained by the land owner was made by law appurtenant to the land until they were paid for in full. The idea back of this is as far as possible to make the land and water forever inseparable, to prevent a monopoly of the water ever falling into the hands of an individual or corporation. The theory back of it all is fundamental to agricultural success in arid regions.

The owner of the water is controller of the welfare of the community. No state can afford to permit such a condition of water monopolies to arise. Some have maintained that a water right could not be made permanently appurtenant to the land even if it is to the interest of the public welfare. If water is public property, as many of the States declare, and the appropriation and application of it is only a right of usage why cannot the State provide how and where that right may be exercised? It would seem that the State could insist upon the usage in accordance with the terms upon which the right was acquired. The State having granted an individual the right to use its property at a certain place and for a certain purpose it could reasonably prevent the use at another place or for another purpose. It is a question of public policy whether to make it appurtenant to the land or not. No doubt it would be the safer policy to make it appurtenant to the land although it may be necessary to permit a change from one piece of land to another after examination by a competent board. Such a policy would avoid any possibility of a water monopoly either by large corporations or by individuals. At the same time it would prevent an injustice being done a water user whose lands had become valueless through seepage from higher lands. An owner of a piece of land is not responsible when the land becomes water-logged but it is usually an unavoidable condition arising from irrigation at higher levels. If he possessed or could obtain by purchase higher lands the transfer by public authority of the use of water could be made without any danger and also without the user suffering a total loss.

The following summary of the Reclamation Service gives the area reclaimed by the government for the United States:

RECLAMATION TABLE

1917	Irrigable Acreage	Irrigated Acreage	Irrigated Farms	Cropped Acreage	Crop Value
	1,600,000	1,010,000	23,000	925,000	35,000,000

Estimated Area of Projects on Completion	Farms	Miles of Canals	Total Cost (Gross)
3,072,795 acres	62,451	9,970	$123,037,579.02

Population of Farms and Towns.	Number of Schools	Average cost per acre.
266,605	351	$50

The foregoing has been a general discussion of the Reclamation Act and policy of the service and would apply equally well to the projects outside of Utah as to the one within the State. The discussion, however, has been necessary to an understanding of the Strawberry Reclamation Project in the State of Utah.

The territory of Utah has always been interested in irrigation undertakings for on it rested the basis of its economic success. Soon after statehood the legislature appropriated to the State Board of Land Commissioners three thousand dollars to determine upon the feasibility of the construction of two reservoirs. The sites were to be selected and investigated by the board. The board made a favorable report of the Strawberry Valley Project. A careful survey revealed the fact that while entirely feasible it was too costly to be undertaken by a young state. The estimated cost ran well over three million dollars.

When it became obvious that the State could not undertake the project, the farmers of Spanish Fork and Payson undertook to interest the United States Reclamation Service in the undertaking. They were successful. Most of the farmers of these towns already had a partial supply of water for their crops but needed an additional supply to supplement it.

The Strawberry Valley Project was different from several of the other United States projects. Besides involving the excavation of a long tunnel through the mountains the lands to be supplied with water were located in the oldest settled part of the State. Ninety-two per cent. of the lands were held in private ownership. Some of them were entirely without water while others were partially supplied but in varying amounts, from six to eighteen inches. The lands when well supplied with water were very desirable for intensified farming.

The reservoir and water supply were located in Wasatch County on the east side of the Wasatch Range of mountains and in the drainage basin of the Colorado River. The lands to be irrigated were located in Utah County on the west side of the Wasatch Range of mountains and in the Great Basin. The drainage area of the reservoir site covered about 175 square miles with an average rainfall of about 21 inches. The Strawberry River and the Indian and Trail Hollow Creeks flowed into the reservoir.

The tunnel that connects the reservoir and canal system supplying the land is 19,897 feet long and pierces the mountain at its greatest depth 1400 feet below the summit. The tunnel in the clear is seven feet wide and six and one-half feet high. It is lined throughout with concrete. The eastern end of the tunnel has an elevation of 7508 feet above sea level. The western end is fifty-six feet lower. The capacity of the tunnel is 600 second feet. The construction of the tunnel was begun in the fall of 1906. The work was delayed for various reasons and was not completed until June 1912.

The dam itself is an earth-fill structure, 72 feet above the original river bed. It has a reenforced concrete core wall extending 69 feet above the bed of the stream and from 10 to 25 feet below into bed rock. The dam is 500 feet long on the top and was completed September 1913.

From the western mouth of the tunnel the water flows into Diamond Fork, a tributary of the Spanish Fork River. From the Spanish Fork River it is diverted into some six different canal systems. The high line canal was constructed by the Reclamation Service and also a short canal to supply Mapleton. The others were old canals built many years ago to divert the natural flow of the Spanish Fork River. They have been owned, controlled and operated by the farmers for over half a century. As a consequence of this long period of ownership and control they were left in charge of the farmers and the Reclamation Service merely took upon itself the obligation of delivering so much water in bulk at the heads of the several canals. The High Line Canal although built by the service was likewise turned over to the farmers for management.

At Mapleton and at Springville irrigation districts were organized and bonded to the Reclamation Service for the purchase price of the water contracted for.

Out of about 50,000 acres either partially or fully supplied with water, only 3500 acres were public lands. As soon as the project was determined upon a lien upon the public land became effective for the water charge. The private lands, outside of those included in the irrigation districts which were all bonded for water, were individually mortgaged to the United States Government for the water payments and the maintenance and operation charges.

About three-fifths of the total area irrigated were old cultivated lands and partially supplied with water. The amounts attached to each tract varied considerably according to priority of appropriation. In view of this situation it was arranged to sell water to the land owners according to their different needs. In no case, however, would any farmer be supplied with an amount of water exceeding two acre-feet, this to include water received from all sources. The lands supplied by the High Line Canal were allowed two acre-feet and from crops produced upon this high land which was formerly very dry it appears reasonably sufficient although many maintain that it should be increased. The cost of the water right and the maintenance, quoting from Sixteenth Annual Report of the Reclamation Service page 292, are as follows:

Application for water-right.— All water-right applications must be made to the project manager, United States Reclamation Service, Provo, Utah, upon forms provided for that purpose, and may be made on and after the date hereof. Such application may be made for one-half acre-foot of water per acre, 1 acre-foot per acre, 1½ acre-feet per acre, or 2 acre-feet per acre, as the applicant may desire.

Classes of charges for water-rights.— The water-right charges are of two kinds, to wit: (1) A charge against each irrigable acre to cover cost of construction of the irrigation system, termed the construction charge; and (2) an annual charge against each irrigable acre to cover cost of operation and maintenance of the system, termed the operation and maintenance charge.

Construction Charges.— The construction charges for said lands are of four kinds, to wit: (1) $22.50 per irrigable acre when application is made for one-half of 1 acre-foot of water per irrigable acre; (2) $45 per irrigable acre when application is made for 1 acre-foot of water per irrigable acre; (3) $67.50 per irrigable acre when application is made for 1½ acre-feet of water per irrigable acre; and (4) $90 per irrigable acre when application is made for 2 acre-feet of water per irrigable acre. Such charges are in each case payable as follows:

(a) For lands that were entered prior to August 13, 1914, subject to the reclamation law, or prior to that date, were subjected by contract, trust deed, or otherwise to the provisions of the reclamation law, said construction charge shall be paid in 10 equal annual installments, the first of which shall be paid at the time of filing water-right application, and subsequent installments shall be due and payable December 1 of each year thereafter: Provided, however, That if water-right application subject to the provisions of said reclamation extension act, or an acceptance of the provisions of same in accordance with section 14 thereof, be filed within six months from the date of this notice, said construction charge shall be paid in 20 annual installments on December 1 of each year thereafter, in which event the first four installments shall each be 2 per cent., the next two installments shall each be 4 per cent., and the next 14 each 6 per cent. of the total construction charge.

(b) For the remaining lands an initial payment of 5 per cent. of the construction charge shall be made at the time of filing water-right application, and the remainder of the construction charge shall be paid in 15 annual installments, the first 5 of which shall each be 5 per cent. and the remainder each 7 per cent. of the total construction charge. The first of said 15 annual installments shall become due and payable December 1 of the fifth calendar year after the initial installment, and subsequent installments shall become due and payable on December 1 of each calendar year thereafter.

Increased construction charge in certain cases.—In all cases where water-right application for lands in private ownership, or for lands under entries not subject to the reclamation law, shall not be made within one year from the date of this notice, the construction charge for such lands shall be increased 5 per cent. each year until such application is made and an initial installment is paid.

Advance payment of construction charge permissible.—Any water-right applicant may, at his option, pay in advance the whole or any part of the construction charge owing by him within any shorter period than that prescribed by this notice.

Operation and maintenance charge.—The minimum operation and maintenance charge for the irrigation season of 1917, and thereafter until further notice, shall be 40 cents per acre of irrigable land, whether water is used thereon or not, which will entitle the water user to not more than 1 acre-foot of water per irrigable acre, and in no event more than the amount per acre specified in the water-right application. Should water be needed in excess of 1 acre-foot per irrigable acre and the water-right application provides for more than that amount, it will be furnished at the rate of 40 cents per acre-foot. All such charges will be payable on December 1 of each year for the preceding irrigation season, but where water-right application is made for public land entered under the reclamation law after June 15 in any year, or where water-right application is made for land in private ownership after August 1 in any year, no operation and maintenance charge will be made for water delivered during the remainder of the irrigation season in which the water-right application is made.

Net cost of construction of project June 30, 1918, $3,443,961.98. In general the purchasers of water under the Strawberry Valley Project are very well satisfied with water supplied and the service rendered. The supplemental water supply to the old lands has proved very beneficial in increasing crop production. The charge is reasonable.

All the lands are either in old settled communities or near by and as a consequence no great hardships seemed to have been suffered by the owners of the dry lands in redeeming them. Most of them were under cultivation before the water came. So that in the main the land was ready for irrigation. Thus the project has not experienced the wholesale shifting of settlers which has been the case on too many projects.

Before the coming of the water the dry lands sold for $25.00 an acre, but in 1917 they rented for sugar beet production for $30.00 an acre.

The total number of farms receiving water from the project is 1812, with a total area of about 50,000 acres and an average of slightly over thirty acres to a farm. In the Mapleton and Springville sections, a fruit area, the acreage runs from two to twenty acres for a farm.

This section of the State is distinctly a fruit and sugar-beet area. The more important fruits grown are raspberries, cherries, peaches, and apples.

Three sugar factories have been built since the project was completed and the farmers as a rule are very prosperous. They are fairly well supplied with horses, cows, hogs and other live stock.

In addition to the foregoing crops, considerable alfalfa, hay and potatoes are grown and also some wheat and oats. An electric plant was installed by the Reclamation Service to supply power to the project and power and light to the surrounding settlements. Payson, Salem, and Spanish Fork have installed electric lighting plants for the several towns. They buy the power from the Reclamation Service *en bloc.*

CHAPTER XVI

DRAINAGE

Drainage is so closely associated with irrigation and is nearly always a result of it in the arid parts of the United States, that it would not be advisable to close this treatise without a brief consideration of the institutions of drainage in Utah.

Drainage in irrigated areas is for the purpose of removing the water from the soil which is already over-supplied with moisture and has thereby lost much of its fertility, or for the protection of lands that may become over-supplied with moisture. In the humid regions, such conditions are brought about through rainfall but in the arid regions they are due in the main to seepage from the irrigation canals and also from irrigation itself. Such a condition is almost certain to arise on a considerable percentage of all lands irrigated, and for that reason many authorities on irrigation maintain that a drainage system should be planned at the same time as the irrigation system is installed. At all events, its feasibility should be fully established. If the irrigation system is constructed to supply a large area with water, portions of it will soon need drainage.

The pioneer settler finds it impossible to stop to consider drainage. The tasks that will supply his immediate needs of food and shelter are ones with which he must concern himself. The low lands when free of minerals are usually of good quality, more accessible to water and the first to be cultivated by the pioneer. As long as the lowlands will furnish a food supply the higher lands are ordinarily not cultivated and there is little trouble from excessive water from seepage. When, however, the higher lands up to the very foothills are brought under cultivation and irrigated the lower lands frequently through seepage from above become water-logged and lose their productivity. This is especially true if a drainage system is not provided. Where the installation of a drainage system is not possible for various reasons, it frequently happens that all or a large portion of these lands have to be abandoned. Moreover where drainage is undertaken, like irrigation it must be a district or community undertaking. It cannot be installed individually. In the case of canal construction for irrigation purposes all the cultivators need a supply of water in order to produce crops. Irrigation water they must have at once, and cooperative action is comparatively easy to arrange.

Cooperative action is just as essential in drainage undertaking, but it is much more difficult to obtain, because the land in a given area does not all become water-logged at the same time. The process is a gradual one, where the low lands suffer first. It often takes years before all the lands are seriously injured. The higher lands of any given area are the last to suffer and it is difficult, if not impossible, to secure the consent of the owners of these lands for drainage. In fact it has been found impossible to proceed on the basis of individual consent. The Western States therefore have been compelled to enact laws creating irrigation districts wherein a certain percentage of land involved determines the action to be taken. Although there is some variance, ordinarily a majority of the acreage decides whether a district is to be organized or not. The individual owner cannot determine the policy to be pursued only in so far as his land is a part of the whole.

In Utah it was many years before any legal means were provided for establishing drainage districts. What was done was confined to individual or voluntary cooperative actions. This was not due to the fact that there was not a necessity for the drainage of farm lands, quite to the contrary, but rather to a want of an appreciation of what drainage would accomplish.

In 1896, the first state legislature passed a law making provisions for the organization of drainage districts. The law authorized the county commissioners to organize a district upon the petition of fifty or more land owners, constituting a majority of the land owners of the proposed drainage district. Before action could be taken upon the petition it was necessary to advertise it for fourteen days in some newspaper having general circulation in the county. At the public hearing, upon petition, new lands not included in the original petition could be included or lands which would not be benefited could be excluded. If it was decided by the county commissioners to call an election a description of the lands to be included in the proposed district must be included in the call. At the election a favorable majority of two-thirds of all the votes cast was necessary to create a district. Only freeholders living in the district were entitled to vote. A board of directors were elected at the time the question of the district was passed upon.

The directors organized by electing a president, secretary, treasurer and such other officers and employees as were necessary.

The money for the construction and maintenance of the drainage system was to be raised by taxation. An estimate of the amount required for the ensuing year was to be made by the board before the first of March of each year. The law provided that, after having entered the valuation of property on the assessment books the auditor of the county should levy such per cent. as would raise the amount required by the board, which levy must be uniform on all lands within the district as returned on the assessment roll. The county treasurer was also authorized and required to collect district taxes. The tax could not exceed one per cent. of the value of the land in one year. The Board of County Commissioners were to act as a board of equalization for the district. The taxes were a lien on the land.

The work of construction of a drainage system could be done by the district or by contract.

Nothing was done under this law. The price of good land in most parts of the State at that date rarely exceeded a hundred an acre and, in general, the price was far below. Water-logged lands were valued far below the above price so that one per cent. of their value would afford only a negligible sum toward drainage which cost from ten to forty or fifty dollars an acre.

The act of 1905 was a re-enactment of the law of 1896 in every particular except a provision for bonding the district was incorporated in the law. The bonding capacity of the district was limited to three dollars an acre. The time limit of the bonds was fixed at twenty years and the interest was not to exceed six per cent. The annual estimate for maintenance, where bonds had been issued, must contain items for interest and sinking fund.

The act of 1907 changed the bonding ability of the district for drainage purposes from three dollars per acre to four per cent. of the value of the taxable property of the district. Taxes for construction and maintenance were to be levied upon each acre according to the benefits derived instead of according to the value of the property. The board of trustees of the district constituted the board of assessment and also the board of equalization. When the district board had completed its work of assessment and equalization, it was required to transmit a list of the assessed property to the county auditor who was required to enter it on the county tax books. When this was done it became the duty of the county treasurer to collect the district taxes at the same time as the regular county and State taxes were collected. In Argyle v. Johnson (1911, 1180 Pac. 487), the drainage law was declared unconstitutional for various reasons: First, the law did not provide any means for a landowner to have a hearing to determine whether his land would be benefited by the proposed system of drainage. Secondly, the law gave the county commissioners power to include, upon request, lands which would be benefited but which were not embraced in the original petition, but it did not give the commission authority to exclude lands which would not be benefited. Thirdly, a landowner within the district must be an elector in the district before he could vote on the issuance of bonds which were to become a lien upon his lands. So that a man owning land within the district but living outside had nothing to say about obligations which would become a lien upon his land; finally no opportunity was afforded to bring any of the foregoing questions before a court for a determination. As a consequence the Supreme Court of Utah declared the law of 1907 unconstitutional as taking private property without due process of law for the reason that owners of land were not given a right of a hearing before a competent tribunal to determine whether the drainage was beneficial to their lands or the tax levied was an equitable one.

The act of 1913 was very similar in many respects to the 1907 act except that an effort was made to overcome the difficulties which made the old law unconstitutional. Section 5 gave the County Commissioners authority to hold a hearing and to exclude lands which in their judgment will not be benefited by the proposed system of drainage. From this decision an appeal lay to the district. While the act as a whole was clearly drawn, the Supreme Court in Moody vs. Millard County Drainage District Number 1 et al. held that the language in Section 2 was so indefinite as to make procedure uncertain in the issuance of bonds. The district was therefore prohibited from issuing bonds. The drainage act of 1915 was passed to remedy the defects in the act of 1913.

The primary features of the drainage legislation now on the statute books of the State may be outlined as follows: a majority of the landowners who own a third of the area of the proposed district or a third of the landowners who own a majority of the lands to be reclaimed may petition the county commissioners to organize a drainage district. After proper notice has been given for twenty-one days the county commissioners are required to give the petition a hearing. At the conclusion of the hearing the commission has authority to exclude lands which will not be benefited by a drainage system and likewise to include, upon petition, lands which will be benefited, but which were not included in the original petition. The action of the county commission is subject to review by a district court if an appeal is taken within six months after the commission acts.

A board of three supervisors is appointed by the board of County Commissioners. The board of supervisors when organized is the governing body of the district. It has authority to employ an engineer, and assistants, to make contracts, and to do other things within the power of the corporation.

It is the duty of the supervisors upon entering on their duties to examine carefully all of the lands of the proposed drainage area and the routes of the proposed drains; to make an estimate of the original cost and the maintenance of the system and to determine whether the benefits of the system will more than equal the damages done. When this report is completed, it is forwarded to the board of county commissioners. If the damages of open canals and the injury by flooding lower lands outweigh the benefits derived the district is abandoned.

In assessing the lands, the law says that the board of supervisors "shall assess the entire amount needed in each year against all the land within said district in proportion to the benefits resulting to each tract of land by the construction and maintenance of such drainage system; the said board of supervisors shall view each tract of land within the district and shall carefully consider all the damages and benefits that each particular tract of land will receive from the construction and maintenance of such drainage system and assess each tract of land in accordance with the benefits received by it, making proper allowance for damages if there be any.

The board of county commissioners acts as a board of equalization for the district to adjust inequalities.

The tax when assessed becomes a lien upon the real property.

The construction of drains must be done by contract. Twenty days' notice for proposals to do the work must be given in a newspaper having general circulation in the district.

The law authorizes the bonding of the district but says "that in no case shall the amount of bonds exceed the benefits assessed." Before bonds can be issued they must be approved at an election by a majority vote of the land owners of the district. The law provides that the rate of interest on the bonds shall not exceed seven per cent. per annum. The bonds may run for not less than ten nor more than twenty years. When issued they become a lien upon the land.

The remainder of the act deals with methods of procedure which are common to all public corporations.

The new law of 1919 in the main is a re-enactment of the laws of 1913 and 1915. Several minor amendments were made to make clear the diction. There are however two important new provisions. Section 2047 provides for entering into drainage contracts with the United States. It is enacted undoubtedly in the expectation that the Federal Government will make provisions for advancing funds for drainage construction. It reads as follows: "The board (of supervisors) shall have power to enter into any obligation or contract with the United States under any act of Congress now enacted, or which may hereafter be enacted, and the rules and regulations established thereunder, for the construction or operation and maintenance of the drainage system or any drainage works, or as principal guarantor of indebtedness to the United States on account of district lands."

The second important provision provides that the courts are authorized to pass upon the legality of drainage bonds or proposed contracts with the United States upon the request of the board of supervisors or any interested party. This provision is a wise one as it makes it possible to establish the legality of the bonds before they are issued or the contract for the work before it is undertaken.

Although many parts of the State are in need of drainage up to the present not much has been accomplished.

The following tabulation gives the projects underway and completed. Outside of individual undertakings none are complete although the Corinne system is almost complete. Drainage cost from $20 to $100.00 an acre:

NAME		AREA
Individual Tracts		6,000 Acres
Box Elder County		
Corinne Drainage District		12,000 Acres
Millard County		
Hinckley	No. 1	52,000 Acres
District	No. 2	22,000 Acres
District	No. 3	44,000 Acres
District	No. 4	10,000 Acres
Delta South Tract		4,554 Acres
Salt Lake County		
Brighton Drainage District		4,080 Acres
Sevier County		
Sevier County Drainage District No. 1		4,500 Acres
Sevier County Drainage District No. 2		2,600 Acres
Sevier County Drainage District No. 3		1,361 Acres
Utah County		
Lake Shore and Benjamin Drainage District		3,050 Acres
Lake Shore Drainage District		3,050 Acres
Lake Shore and North Drainage District		631 Acres
Utah County Drainage District No. 1		3,000 Acres

CHAPTER XVII

THE LEGISLATION OF 1919

In the 1919 session of the Utah Legislature, three important measures pertaining to irrigation and drainage were passed, (a) The Water Rights Law, (b) The Irrigation District Law and (c) The Drainage Law. The drainage law has been dealt with, so far as is necessary, in Chapter XVI. The discussions in this chapter will, therefore, be confined to the Water Rights Law and the Irrigation District Law. Moreover, only the main provisions of these laws will be considered in the discussion. Many, in fact most of the provisions, are only re-enactments of similar provisions already in force. Some are an evolution of provisions in force and the others are entirely new to Utah. Where the provisions are in force and have been discussed in previous chapters they will be merely mentioned or ignored unless in some way they present new faces of irrigation problems.

WATER RIGHTS

In one particular the new Water Rights Law is a departure from former legislation within this commonwealth. It follows rather closely the Oregon system in the adjudication of water rights, except it replaces the water commission by the State Engineer. It places the authority to make the preliminary investigation and determination of water rights under the State Engineer. It centers this great power in his hands, and thereby makes it possible for him to do much in regard to water adjustment in the State. Finally the State has begun a policy of concentration with a view of securing results in the way of determining the respective rights of the users of water throughout the State. It is both the privilege and the duty of the State Engineer actively to undertake the work and bring the results before the courts for final determination. If the work of the State Engineer is carefully and tactfully done it should lessen the work of the courts considerably.

Water running in well known and defined channels is the property of the public subject to beneficial use.

Persons or corporations desiring to construct canals can obtain rights of way by the law of eminent domain upon private lands. The owner of the lands, however, must be adequately compensated for land and damages. Where there are canals already in existence which will serve the purpose appropriators of water may enlarge them to convey additional water. They must, however, bear the cost of construction. In many cases this makes the building of new canals unnecessary and prevents considerable damages, thereby, to good arable lands.

In the old law, the period of abandonment of a water right was fixed at seven years, the new law reduces it to five years. Even five years is a long time to allow the use of water to remain in an uncertain condition in the arid region. The writer feels certain that the future will see the period of time considerably reduced.

The term of office of the State Engineer is extended from four to six years and the salary raised from $3,000 to $4,000 a year.

Under the old law the State Engineer, as already indicated in previous discussions, had authority to measure the streams and make other determinations, but there his power ended. He could present his conclusions to the courts but they could be and were ignored without an exception. In the 1919 law section 7 provides that the State Engineer shall have "general administrative supervision of the water of the State and of their measurement, appropriation, apportionment and distribution. He shall have power to make and publish such rules and regulations as may be necessary from time to time fully to carry out the duties of his office and particularly to secure the equitable and fair apportionment and distribution of the water according to the respective rights of the appropriators." Section 20 further defines his duties as follows: "Upon a verified petition to the State Engineer, signed by five or more water users upon any stream or water source requesting the determination of the relative rights of the various claimants to the waters of such streams or water source, it shall be the duty of State Engineer, if upon investigation he finds the facts and conditions are such as to justify, to make a determination of said rights fixing a time for making such examination and taking such testimony as will enable him to determine the rights of the various claimants." This makes it very easy to set the official machinery in motion to secure a determination of water rights. It should be very easy to secure five petitioners. The section, however, embodies a menacing phrase where it says "the determination of the relative rights, etc." This may make it possible, where there are no contestants, for the users of a stream to have all the water allotted to them, even if far in excess of their actual needs, in case the court holds that the engineer has only the authority to determine their relative rights. The interpretation of this section by the courts will be watched with considerable interest, for it may well destroy much of the value of the law wherein it attempts to limit the users of water to their economic and beneficial use irrespective of their claims.

When the work of surveying the land and streams is complete, the State Engineer presents to the clerk of the district court a report, giving the names, addresses, acreage, use and allotments of water in the district. With the report before him it becomes the duty of the clerk to notify all users of water of the conclusions of the engineer. On the other hand if a water suit is filed in a district court the clerk is required to notify the State Engineer whose duty it then becomes to measure the water and the lands of the several users and report the result to the clerk of the court together with the names, addresses and allotments made to them. Whether the action is initiated by the State Engineer or by the water users, the water users have the right to appeal from the conclusions of the State Engineer to the district court and on up to the Supreme Court. If, however, the appeal is not taken within a given time the court enters a decree affirming the determinations and apportionments of the State Engineer. If the water users do appeal from the conclusions of the State Engineer the court proceeds to try the case according to ordinary procedure.

A re-determination of the water rights may be had at any time on the application of a water user, who must accompany the application for a re-determination by a bond in double the amount of the estimated costs. If the decision goes against the applicant he must pay the entire costs. The bond is to insure the payment of costs.

New appropriations of water can only be made on application to the office of the State Engineer. The application must describe the stream, the source, the point of diversion, the use and the quality of water applied for. Before the application can be approved notice must be published in a newspaper having general circulation in the district where the water is located. The State Engineer is authorized to make such examinations, surveys and give such hearings as will satisfy him as to the justness of the application. At the conclusion of the examination he may grant the application or he may deny it, if it infringes upon existing rights. Following a similar procedure a user of water may change the point of diversion or the use of the water, but no change of the point of diversion or the use can be made to the injury of any user. Where an application is granted if it involves the construction of a new canal the construction must begin within six months and be pursued with reasonable diligence. In all cases decided by the State Engineer appeal lies to the District Court.

Water may be turned into a natural channel or in a reservoir and taken out again, due allowance being made for loss through seepage, evaporation and the like. Of course the permission is dependent upon the capacity of the channel or the reservoir to retain the additional flow of water with safety and in the case of a reservoir a proportionate part of the cost of construction must naturally be borne.

Priority of appropriation is a rule which governs in the use of water.

Irrigation or reservoir companies may own stock in other irrigation or reservoir companies.

If for any reason it becomes impracticable to use water beneficially on a piece of land where it has been used, it may be transferred to other lands, "if such change can be made without detriment to existing rights."

The law still retains the provision which allows the user of water to regard his right as personal property.

The District Court or the State Engineer is authorized to appoint a water commissioner. In general, however, it is the duty of the State Engineer and his assistants to carry into effect the judgments and decree of the courts in relation to the diversion, allotments, distribution and use of the waters of the State.

In order to protect life and property against poorly constructed dams in streams or reservoirs, the plans, specifications and drawings are subject to the approval of the State Engineer. Some recent failures of dams have made such a course necessary. The law says that "dams above ten feet in height or any dam less than ten feet in height which will impound more than one hundred acre feet of water" shall be subject to the approval of the State Engineer. He is also empowered to supervise all dams during their construction. If the requirements are not lived up to he is authorized to suspend operation. In the case of dams already built he has authority to limit the amount of water impounded or if unsafe to forbid the storage of water entirely.

IRRIGATION DISTRICTS

On the petition of fifty or a majority of the landowners or upon the request of the Governor of the State the county commissioners may take the necessary steps to organize an irrigation district. The petition of the landowners must be accompanied by a bond sufficient in amount to pay the cost of organizing, so that if the land owners when they vote upon the question of establishing a district should decide in the negative the county would be protected against loss. In case the request, coming from the Governor is decided in the negative by the landowners, one-half of the cost is borne by the county and one-half by the State. There is no reason in the world why this power should be granted to the Governor of the State. The establishment of a district is a matter that concerns the landowners and the landowners alone. If they want it they can petition for it and if they do not want it the initiative of the Governor will not help because they will vote it down and a needless expense will have been incurred.

On the receipt of the petition, the county commissioners must make a water survey and allotment of water district. "The survey is made for the purpose of determining and alloting the maximum amounts of water which could be beneficially used upon such lands; each forty acre or smaller tracts in separate ownership shall be separately surveyed and the allotment made therefore." The foregoing work at the request of the county commission is to be done by the State Engineer. When the work is completed, he must file his report with the commissioners. They are then required to give notice through a newspaper of their intention to organize an irrigation district and that at a certain fixed time a hearing will be held at which the landowners may appear before them and ask that their lands shall be included or excluded in the proposed district. In a request for the exclusion of lands from the proposed district the owners must show that they already have sufficient water to supply their needs or that they will not be benefited by the new system. On the other hand, lands not included in the original petition may be included upon the petition of the owners. At the completion of the hearing, the commissioners are required to prepare a plat of the lands to be included. An appeal from the conclusions of the county commission lies to the District Court.

As soon as the lands are listed and platted, the county commission calls an election at which the landowners decide by ballot whether they desire a district or not. A majority of the votes cast decides the question. The number of votes cast by each landowner is determined by the allotment of water made to him by the State Engineer. He is allowed to cast one vote for each acre-foot of water or fraction thereof. Directors are voted for at the same time and if the vote is favorable to the organization of a district they proceed to organize to carry on the work. For administrative purposes the district is divided into three sub-districts and one director is elected from each subdivision.

In section 11 the law says that "upon completion of the organization of the district and before any bond issue or contract is voted on, any assessment levied, or toll or charge imposed, the board of directors having first determined the amount of water required for the land within the district and the amount of water available for use of the district, shall make a final allotment of water for each forty-acre tract or smaller tract in separate ownership, which allotment for each tract shall not be less than its proportion of the engineering allotment as a basis; such allotment may, however, be increased to an amount not exceeding the amount allotted by the State Engineer should the amount of water available for the district be increased. Such final allotment shall be the basis for all assessments, tolls, and charges levied against the land and shall also thereafter be the basis of the vote at all elections."

The board of directors with the approval of the landowners may purchase a system already in existence or enter into a contract for water with the United States Government.

Near the end of section 11 is found the following provision: "The board of directors shall have power to lease or rent the use of water not needed by the landowners of said district." The lease is not allowed to run for longer than five years. A similar provision was found in earlier laws, but the term of the lease could not exceed one year. This undoubtedly is intended to cover a temporary arrangement until such user of water can be admitted into the district. The provision, however, does open the way for a district to speculate in water. For the district can refuse to admit the landowners using the leased water into the district and make them perpetually dependent upon these short term leases which are destructive of the establishment of permanent agriculture. It is even questionable, on a five year lease, whether a landowner would be justified in preparing the land for irrigation upon such a short term. He could not afford to reclaim a difficult piece of land. The provision as it now stands is so vicious that it should be recast or repealed, because it is against home building and in favor of commercialism in water.

The district may issue bonds for the purchase or construction of an irrigation system. Before bonds can be issued they must be approved by a two-third majority vote at a special election. The bonds may run for forty years. Upon the application of the board of directors or any interested party, the legality of the entire proceedings pertaining to the issue of the bonds can be reviewed by the courts before the bonds are sold.

An annual estimate of the funds needed to conduct the business of the district must be prepared by board of directors before April the first. The estimate must include maintenance, interest, rentals, improvements, etc. It becomes the duty of the County Assessor to assess such levies against the lands of the district upon the basis of " the value per acre-foot of water allotted to the lands within the district." Where levies are made to provide funds to carry out contracts entered into with the United States Government assessments must be made according to the Federal laws. Upon the completion of the assessment it is the duty of the county commissioners to fix a rate that will raise the required revenue. The revenue laws of the State apply in the collection of the district taxes.

In the construction of a new system the work must be done by contract.

In case of an insufficiency of water the board of directors must distribute it "upon alternate days to different localities as they in their judgment think best for all parties concerned."

Section 30 of the law also provides that after a district has been organized lands may, under certain conditions, be included or excluded.

The board is authorized, where necessary, to construct drains to protect water-logged areas of the district.

It was said of the first irrigation district law of the territory of Utah that it was too short to be workable. Such criticism could not possibly apply to the present law, because it is so lengthy as to be almost unwieldy. Except the allotment of water by the State Engineer and the board of directors there is no new principle involved in the act. The law in section 2 provides for a survey "for the purpose of determining and allotting the maximum amounts (of water) which could be beneficially used on such lands." This provision would have more nearly conformed to present day tendencies in the Western States if it had provided for the amount of water necessary for economic and beneficial use.

The law as it stands offers very little more protection for bond holders than the old law.

A law for irrigation districts which expect to float bonds, should contain provisions providing for means of supplying definite information as to the quantity of water to be supplied by the system to each acre, together with the quality of the water, particularly as to its mineral content. A soil survey should be required and the agricultural quality of the land specifically set forth. In the same survey it should be determined whether there were any minerals in the soil which would injuriously affect crop production. The danger of the lands becoming water-logged and the possibility of installing drainage should be passed upon. The capacity and durability of the proposed irrigation system to give the service required should be established beyond a reasonable doubt. Finally the State should supervise the expenditure of the funds, so that the purchasers of the securities of irrigation districts will be reasonably well assured that the funds will be used for the purchase of water rights or a water system or for the construction of dams and canals and not for promotion and speculative purposes.

Until these or similar provisions are written into the law, the purchasers of irrigation district bonds can have no assurance of their value unless they are prepared to make extensive investigations on their own account.

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